



Professor Peter Lock (left) instructs his students in Automotive Collision Repair Technology at Contra Costa College.

# CAREER TECHNICAL EDUCATION ENHANCEMENT FUND REPORT

**2015**

California Community Colleges Chancellor's Office  
Brice W. Harris, Chancellor

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March 1, 2015

The Honorable Mark Leno, Chair  
Joint Legislative Budget Committee  
1020 N Street, Room 553  
Sacramento, CA 95814  
Attention: Ms. Peggy Collins

**RE: Item 6870-101-0001-California Community Colleges-Economic and Workforce  
Development Program (2014-15 Budget Act)**

Dear Sen. Leno:

I am pleased to present the California Community Colleges Chancellor's Office report on the Career Technical Education Enhancement Fund, otherwise known as the CTE Enhancement Fund.

The 2014-15 Budget Act provided, on an one-time basis, an appropriation to establish the fund to provide an incentive for community colleges to develop, enhance, retool and expand quality career technical education offerings that build upon existing community college regional capacity to respond to regional labor market needs.

Supplemental budget language requires the Chancellor's Office to report on the use of these funds, as well as provide recommendations on how to measure student and workforce outcomes associated with this funding and what should be appropriate future funding.

If you have any questions regarding this report, please contact Workforce and Economic Development Division Vice Chancellor Van Ton-Quinlivan at 916-327-5492 or [vtquinlivan@cccco.edu](mailto:vtquinlivan@cccco.edu).

Thank you for your continued interest in this important program.

Sincerely,

A handwritten signature in black ink that reads "Brice W. Harris". The signature is written in a cursive, flowing style.

Brice W. Harris  
Chancellor





# CAREER TECHNICAL EDUCATION ENHANCEMENT FUND REPORT

## EXECUTIVE SUMMARY

The California Community Colleges serves more than 2.1 million students and is the largest system of higher education in the nation. The state’s 112 colleges provide workforce training, teach basic math and English, and prepare students for transfer to four-year universities and colleges.

Senate Bill 852 established the Career Technical Education (CTE) Enhancement Fund, which allocated on a one time basis \$50 million in the 2014-15 budget year to expand, enhance, and improve upon CTE programs statewide. This funding was designed to help community college CTE programs purchase equipment, align and develop curriculum, and provide professional development trainings to better meet the employment needs of the regional economy in each of seven macro-economic regions. The chancellor of the California Community Colleges distributed funds to the districts designated as fiscal agents according to a formula that factored in CTE full-time students, all full-time students, and the number of colleges in each region.

The regional consortia and the member colleges could apply to use funds for programs of study that met these criteria:

- Be for occupations and sectors that are demonstrated to be in demand in the regional labor market;
- Be for occupations for which regional production of employees is insufficient to meet labor market demand; and
- Demonstrate regional alignment of program and curricula.

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In addition, priority for funding was given to programs that also are in key or emergent sectors identified by the region or are articulated with K-12 or four-year institutions.

Early on a decision was made to divide the total fund into a 60 percent local share to be allocated directly to the colleges based on student enrollments/apportionment and a 40 percent regional share that the member colleges within each region would collectively direct towards capacity-building efforts.

The local share, distributed first, is enabling colleges to address the critical needs of CTE programs for equipment upgrades, curriculum revisions and professional development particularly essential for the following industry sectors whose rapid growth and pace of change creates demand for increased workforce development:

- Advanced manufacturing
- Information communication technology/digital media
- Health
- Advanced transportation and renewables
- Advanced agriculture, water and environmental technologies

- Small business
- Retail, hospitality and tourism
- Energy efficiency and utilities
- Life sciences and biotech
- Global trade and technology

The community colleges directed most of this money toward new equipment and upgrades. This investment strategy reflects the need to keep up with the latest technology in these industries in order to give students the skills they need to find employment, which accounts for the necessity to keep CTE courses relevant to latest business demand and the resulting higher relative cost. Institutions also used these funds for faculty and curriculum development to make sure courses and programs are providing the skills and knowledge that local and regional businesses need in their employees. The body of this report provides an overview to how this 60 percent share is being spent by sector and region.

Allocation of the 40 percent regional share is catalyzing partnerships between colleges as each region develops plans for how they can best use these funds to meet their particular workforce development needs. Each region is approaching this in different ways, with most in the final stages of planning as of this writing.

The targeting of these funds has been greatly assisted by the provision of comprehensive labor market information that enabled each college to assess both the demand for the occupations they prepare students to enter and the supply, to ensure that colleges targeted labor markets where there is a labor market gap. The regional consortia and the colleges also worked with industry specialists (designated as sector navigators) and regional industry liaisons (called deputy sector navigators) for the priority and emergent industries to focus efforts on those occupations with the highest demand for skilled employees. The planning and allocation process for the 40 percent funds is still underway but it is already evident that colleges are figuring out how to leverage economies of scale. For example, based on the number of colleges proposing investments in computer lab technology, the sector liaisons proposed a collaborative approach to providing NETLAB+ to multiple colleges. By centralizing this service and then providing access to multiple colleges through the Internet it becomes possible to provide students with remote 24x7 access to completely up-to-date hardware

and software systems that are essential to preparing them for high-demand, high-wage careers in computer and network support. The North/Far North Regional Consortium has committed a substantial portion of their funds to this effort and the Bay Area Community College Consortium is considering a substantial investment of their share to support over 20 colleges in their region with this system.

In addition to collaborating with member colleges throughout the region, consortium members are also collaborating with area businesses to develop work experience opportunities and internships, as well as partnering with both K-12 and four-year educational institutions to develop career pathways for students starting in public schools and continuing to course, degree or certificate completion in a postsecondary setting. The CTE Enhancement Fund is a relatively small investment compared to the money that the state invests in CTE through the General Fund. Focusing the expenditure of these funds on three strategies is proving to be a very effective way of increasing the effectiveness of the larger investment. Those strategies are:

- Assisting colleges in making use of local and regional labor market demand and supply information, and student employment outcomes data to align college and regional CTE portfolios with employment demand;
- Supporting colleges' efforts to take greater advantage of their regional scale to enable partnerships with regional scale employers and to leverage economies of scale in curriculum and professional development and in the provision of equipment intensive programs; and
- Offsetting the high cost of CTE programs by assisting with the costs of equipment, curriculum and professional development that can make CTE programs too expensive for colleges to offer with the current apportionment funding formulas.

Continuing to provide money in future budgets for the CTE Enhancement Fund will build on the current successes shown by the California Community Colleges. The investment in regional collaboration is an effective way to address the high cost of CTE programs. Without this funding, community colleges will serve fewer CTE students and award fewer CTE credentials, certificates and associate degrees. They will also offer fewer



programs statewide. The funding allocated to CTE EF was provided on a one-time basis. The goal of these funds were to support CTE programs through equipment purchases, curriculum alignment and development, professional development, and other related costs to retool college courses in order to meet regional job needs. The funding model developed for the CTE EF followed the legislation by allocating funds to the seven macro-economic regions in a formula that factored in CTE full-time students, all other community college full-time students, and the number of colleges in each of the seven macro-economic regions.

The chancellor of the California Community Colleges, in consultation with colleges within each region, designated each college district to serve as the fiscal agent for each of the seven regions to distribute the funds. The funds were distributed for career technical education programs that are developed with industry input, matched by industry resources, and adopted by faculty upon certification by the regional consortia. The courses or programs of study for which the funds are requested must meet all of the following criteria:

- (A) Be for occupations and sectors that are demonstrated to be in demand in the regional labor market;
- (B) Be for occupations for which regional production of employees is insufficient to meet labor market demand; and
- (C) Demonstrate regional alignment of program and curricula.

Priority for funding was given to programs that meet all of the criteria listed above and that meet one or more of the following criteria:

- (A) Are in priority sectors identified by the region;
- (B) Are in emerging sectors identified by the region; and
- (C) Are articulated with K-12 or four-year institutions.

## DOING WHAT MATTERS FOR JOBS AND THE ECONOMY (DWM) FRAMEWORK

The Doing What Matters for Jobs and the Economy (DWM) framework, a strategic plan for state workforce and economic development programs in the college system in 2011-12, restructured funding incentives to encourage colleges to collaborate regionally and

opportunities for current employees to upgrade or learn new skills for employment. But, most importantly, without this funding fewer students will find gainful employment in high-value jobs because they will not have been educated and trained in the market-current skills most required by California employers according to their unique regional needs.

Toward this end, the supplemental language of the 2014-15 Budget Package in Item 6870-101-0001-California Community Colleges requested that this report measure student and workforce outcomes following last year's one-time appropriation of \$50 million. The regional and sector report in this document details the impact of those funds. In order to continue this work and also in line with further budget language asking for recommendations for CTE funding in the future, the chancellor of the California Community Colleges is requesting an ongoing outlay of \$25 million in the 2015-16 budget.

## BACKGROUND

The 2014-15 Budget Bill (Senate Bill 852) established the Career Technical Education Enhancement Fund (CTE EF) to expand, enhance and improve upon CTE

cross-regionally. Combined with the Student Success Initiative, DWM is designed as a system of service to community colleges, employers, workers and students aimed at ensuring that community college CTE programs train students to succeed in the 21st century economy and help to close California's skills gap.

The specific goals of DWM are as follows: 1) to supply in-demand skills for employers, 2) create relevant career pathways and stackable credentials, 3) promote student success, and 4) get Californians into open jobs. Key activities under this framework include: focusing on regional priority/emergent sectors and industry clusters (to be referred herein as "sectors"); taking effective practices to scale; integrating and leveraging programming between funding streams; promoting common metrics for student success; and removing structural barriers to execution.

Each region in California identified priority industry sectors on which to focus. The following are the ten priority sectors identified by regions across the state:

- Advanced manufacturing
- Advanced transportation and renewable energy
- Agriculture, water and environmental technologies
- Energy efficiency and utilities
- Global trade and logistics
- Health
- Information and communication technologies (ICT)/digital media
- Life sciences and biotechnology
- Retail, hospitality and tourism
- Small business

## ADDRESSING THE HIGH COST OF CTE

Apportionment is not adequate to cover the full costs of providing effective CTE courses and programs. The CTE EF addresses these costs on a one-time basis but also begins to assess more systematically what the ongoing costs of these programs are. Without access to funding that can help offset these costs, colleges are often forced to move instructional resources to lower cost programs that do not have the high return on investment that CTE programs offer in terms of student employment rates, increased wages and meeting critical industry workforce development needs. The Enhancement Fund maximizes the value of CTE for a college as they manage their port-

folio of offerings, and it effectively incentivizes investment in programs most needed in the labor market.

In 2013, the Institute for Higher Education produced a report entitled "Workforce Investments: State Strategies to Preserve Higher-Cost Career Education Programs in Community and Technical Colleges." The report stated the following about CTE program funding:

In today's highly-skilled economy, rewarding career pathways are available to those who acquire technical skills by enrolling in certificate and associate degree programs in a community or technical college. Such programs are often more costly to offer than liberal arts and sciences programs that prepare students to transfer to four-year institutions to pursue bachelor's degrees, due to the need for smaller class sizes and specialized equipment and facilities. Many of the higher cost CTE programs are in fields and industry sectors that are important to economic growth in most states and regions, such as nursing, allied health, various engineering technologies and alternative energy. Furthermore, investments in equipment and technology that have a limited lifespan due to technology churn are necessary in many CTE programs. In addition, some industry certifications, in allied health for instance, have a mandated student to faculty ratio. Consequently, it can be challenging for colleges and the state governments that fund them, to maintain these programs. When hard fiscal decisions result in diminished offerings of programs that are valuable to students and communities, no one is well-served.

## ALIGNING OUR RESOURCES AND LEVERAGING OUR SCALE TO SERVE REGIONAL ECONOMIES

The CTE EF is providing the resources to colleges that are essential to taking better advantage of our scale to serve regional employers and to providing our students with access to a greater variety of career paths from K-12 to college and onto employment in high-wage jobs. For employers and others entities (boards, agencies, K-12 school districts, etc.), regional alignment allows for one point of contact for all community colleges in a region. For colleges, regional cooperation fosters reduced program costs where sharing of equipment, software or curriculum



is possible. In addition, professional development opportunities and better pricing are possible when multiple colleges come together. Along with better defined and increased number of career pathways and opportunities, students benefit by attaining their educational completion goals and finding gainful employment.

## **MAKING BETTER USE OF LOCAL AND REGIONAL LABOR MARKET INFORMATION AND STUDENT OUTCOMES DATA**

The process for allocating enhancement funds provided the opportunity to exercise our growing capacity to use labor market information (LMI) and student outcomes data to inform college management of their CTE portfolios. Through regional data sharing, dialog and strategic investments, individual college CTE portfolios are being adjusted. By considering the combination of offerings of all colleges in a region, robust regional portfolios of CTE offerings are forming that address the needs of California's regional economies. Using classic or real-time labor market data (along with employer surveys when feasible) to determine industries or occupational clusters where employment opportunities look bright, engaging with employers in those sectors to determine skills required, and looking at where people who leave or complete a program are getting jobs help determine where community colleges should be focusing in a region. With this valuable demand information, college programs within the region that serve these identified high growth sectors are then evaluated together to determine if they are sufficient to meet the projected job openings and requirements across the region or sub-regions. With this data, employer feedback and information, decisions for regional allocation of resources are made that best serve students and incumbent workers, as well as employers of a regional economy.

## **MACROECONOMIC PROJECTS AND INVESTMENTS**

Each of the seven regional consortia developed a process of collaboration to research needs and allocate funding for the 40% Regional Share CTE enhancement funds. Collaboration occurred between member colleges as well as with area industry representatives to develop plans to expand, enhance and improve upon CTE programs to meet the needs for skilled workers in

identified priority and emerging industry sectors. This collaboration allowed the colleges in the region to leverage resources and share in economies of scale to address the high cost of CTE programs and to use labor market information to focus on programs that will benefit both students and employers by closing the skills gap.

### **North/Far North**

The North/Far North Regional Consortium (N/FNRC) is one of seven consortia established by the California Community College Chancellor's Office (CCCCO), designated Region A. The N/FNRC includes 15 member colleges, geographically with Sacramento to the south, the Oregon border to the north, the Pacific Ocean to the west and the Nevada state line to the east. The N/FNRC's goal is to enhance the development of career and technical education leadership and economic development in all of Region-A. As such, the consortium provides an avenue for coordinating regional programs, increasing collaborative responses to state and regional needs, and serves as a primary link between local colleges, Economic and Workforce Development Program centers and initiatives, and the CCCCCO.

Due to the high cost of CTE programs, the 40% CTE Enhancement Fund will ultimately boost Region-A's CTE offerings in advanced manufacturing, advanced transportation, information communications technology, and agriculture. The 40% CTE Enhancement Fund will also strengthen collaborative relationships between community colleges. In strategizing how the 40% CTE EF should be allocated in the region, the N/FNRC collaboratively worked with each member college to formulate what proposals should be geared toward based on regional need. Member colleges worked closely with deputy sector navigators to determine the LMI for the applications. Each member college submitted a proposal to the Regional Consortia (RC) to be analyzed and ranked in order of priority. The priority was established based off of the region's priority and emerging sectors, LMI and industry investment. There were four programs ranked highest to be funded and include a total collaboration between 13 colleges.

The N/FNRC was very motivated to establish a decision and determine the best use of the 40% Regional CTE enhancement funds prior to Dec. 1, 2014 (when the 60% Local CTE Enhancement Fund application was due).

Several colleges were planning to utilize both the 40% and the 60% for their projects if there was support. If there was not, they would have time to revise their 60% applications for other priority projects.

The process went as follows:

The N/FNRC chairs hosted several CCC Confer conference calls in which members were encouraged to present their ideas to the entire membership. After several proposals and verbal presentations, seven colleges submitted written proposals for a portion of the 40% Regional CTE enhancement funds. These proposals were posted to the N/FNRC website for review. Questions were fielded during the presentations. It was the consensus of the voting members to “rank” the seven proposals submitted for the 40% funding. A ranking sheet was sent out to all voting members. The ranking process was the first step toward funding and was used to determine the region’s top priorities.

Toward that end, the N/FN co-chairs met and developed a set of criteria to be used to evaluate each proposal. Each college had one vote, ranking the proposals one through seven. Voting opened at noon on Monday, Nov. 17 and closed on Wednesday, Nov. 19 at 5 p.m. Ballots were sent electronically to voting members and returned via email to the consortia chair. All votes were confidential.

The criteria for voting were sent out as follows:

Does the proposal meet the grant objectives?

#### **All of the Below:**

- Be for occupations and sectors that are demonstrated to be in demand in the regional labor market;
- Be for occupations for which regional production of employees is insufficient to meet labor market demand; and
- Demonstrate regional alignment of program and curricula

#### **One or More of the Below:**

- Are in priority sectors identified by the region

- Are in emerging sectors identified by the region
  - o Percentage/strength of industry match
  - o Number of colleges who will benefit
  - o Distribution of total project funds over the entire region (both North and Far North)
  - o Is it financially sustainable?

After the ranking was completed, it was determined that if the top four ranked programs took a 4 percent further reduction, all four could be funded.

Here is a summary of the region’s four programs to be funded:

#### **Advanced Transportation and Renewables**

American River College will facilitate collaboration between Butte College, Sacramento City College, Yuba College and American River College to enhance curriculum, upgrade training aids and equipment and engage in advanced faculty professional development. Advanced transportation and renewables is an industry sector with projections for rapid growth in Region-A. An examination of Economic Modeling Specialists International (EMSI) LMI (<http://www.economicmodeling.com/>) provided by the Labor Market Centers for Excellence recommends several transportation-related occupations that will be serviced by this collaborative proposal. American River College will work with industry partners to ensure that curriculum is aligned with current industry standards and model their proven articulation process to enable college partners to engage local middle schools and high schools, and create pathways to transportation-related career opportunities. This collaborative effort, sponsored by the California Community Colleges Chancellor’s Office CTE EF, will ultimately ensure that students enter the workforce knowledgeable about alternative fuels technology and be ready for hire.

#### **Advanced Manufacturing**

College of the Siskiyous will facilitate collaboration between their college, Yuba College, Sierra College and College of the Redwoods in the Advanced Manufacturing Sector. In the N/FN Region, more than 45,000 people are employed in advanced manufacturing establishments with an annual payroll of \$2.4 billion. Based on workforce needs and the findings of

a “North Region Program Inventory and Curricular Comparison” conducted by the North Region deputy sector navigator in this sector identifying significant curricular alignment gaps, a N/FN consortium of colleges will create the first-ever N/FN Regional Curriculum for an advanced manufacturing skilled workforce to include the following:

- 1) The establishment of four regional advanced manufacturing hubs. These hubs will be regional sector-specific economic assets, bringing together companies, community colleges and professional organizations to develop the latest manufacturing curricula and training programs in the N/FN Region;
- 2) The development of a new and regionally recognized fundamentals of manufacturing certificate, to be delivered at each hub. The 14-unit certificate will include the development of new curriculum for four courses, delivered via concurrent enrollment, dual enrollment, inter-session, fast track and live virtual training; and
- 3) A new and regionally recognized advanced manufacturing certificate to fill advanced manufacturing sector curricular gaps identified in tiers four and five of the U.S. Department of Labor’s Advanced Manufacturing Competency Model. The 18-unit certificate will include the development of new curriculum for six courses: applied mathematics, CAD, blueprint reading, manufacturing process and computer numerical control machines. This proposal will have a huge impact on CTE students and industry in that it will be increasing the number of qualified students entering the workforce, meeting the current industry standard’s needs and closing the gap.

### **NetLABS Regional Hub**

Los Rios Community College District will be collaborating with each of their four colleges: Folsom Lake College, Cosumnes River College, Sacramento City College and American River College, in addition to Sierra College. The collaboration will create a NetLABS regional hub to provide a virtual environment for software instruction, which will be accessible to the entire North/Far North Region. Additionally, it can serve as a model for all regional consortia and

community colleges in the state through a functional and sustainable resource sharing model. The combination of software and hardware will enable faculty and students from any Internet accessible location without the need for high bandwidth to utilize a virtual lab environment designed to provide “hands-on” experience. The impact this proposal will have on students and the labor market will be increased connection between business/industry and CTE in the North/Far North regardless of their regional location. This will improve access for students to receive high quality CTE training.

### **K-16 Student Engagement and Economic Development (SEED) Program**

Yuba College will be leading collaboration between the following colleges: College of the Siskiyous, Cosumnes River College, Mendocino College, Feather River College, Woodland College and Shasta College. The colleges’ goal is to develop a unique comprehensive K-16 Student Engagement and Economic Development (SEED) program leveraging Aspen Institute recognized ninth-grade Get Focused, Stay Focused career exploration and student educational planning curriculum, dual enrollment policies, and CCCC-supported Associate Degree for Transfer opportunities. Each participating college will align K-14 agriculture program curriculum and programs with regional industry needs. The proposal will have a dual impact on students and the agricultural labor market. It provides for the employment needs of the agricultural labor market and it incorporates a process that includes dual enrollment to support accelerated college completion rates and provision of a trained labor force. Additionally, the approach allows for an increase in the regional labor force of trained workers at various levels of education – from entry level certificates to a pathway that includes transfer to four-year colleges. Lastly, it also incorporates a strong collaboration among industry and the participating colleges, including mentorships, speaking engagements at the colleges and membership on college advisory boards.

### **Bay Area**

The Bay Area Community College Consortium (BACC) is comprised of the 28 colleges surrounding the

San Francisco and Monterey Bays. The BACCC serves as a regional framework to enhance the coordination of regional programs, to increase collaboration on regional priorities, and to serve as a link between college CTE programs, Economic and Workforce Development initiatives and the Chancellor’s Office.

The Bay Region received an allocation of \$11,316,648 in CTE enhancement funds and, like the rest of the state, we allocated 60 percent of these funds (\$6,450,487) directly to the colleges using a formula based on CTE full-time equivalent student (FTES) enrollment and all other FTES in both credit and noncredit courses. BACCC convened a series of regional conversations to determine the best use of the remaining 40 percent (\$4,300,328). This included meetings with the Bay Region CTE Leadership Group, comprised of the CEO, CIO, CTE dean and CTE faculty from each of the 28 colleges; calls with our CTE Consultation Council, a subset of the aforementioned group representing a CEO, CIO, CTE dean and CTE faculty from each of the five economic sub-regions, several regional calls with BACCC members which include CTE deans, deputy sector navigators, faculty and other internal stakeholders, all of which culminated in a draft proposal for investing the 40 percent funds which was discussed and voted on at a Jan. 13, 2015 meeting of the CTE Leadership Group. At that meeting, a two-tiered approach for distributing the 40 percent funds was unanimously approved as follows:

- \$3,000,000 Regional and sub-regional multi-college grants
- \$1,300,000 Direct allocations to colleges for regionally-oriented college-based projects

The intent of the \$3 million for regional and sub-regional multi-college grants is to address the, until recently unacknowledged, high cost of CTE programs by promoting collaboration across colleges that will lead to greater alignment of CTE offerings within the Bay Region and by leveraging our system’s significant scale to better meet regional workforce development needs. Proposals, due on March 13, 2015, that build on existing college capacity to implement programs in high labor market demand areas and can be accomplished within the timeframe of the CTE Enhancement Funds will be prioritized. The \$3 million will support three types of projects:

<b>Regional Priority Sector Initiatives</b> (priority sectors selected based on highest annual labor market demand)
Multi-college projects that support CTE programming in: <ul style="list-style-type: none"><li>• Information and communications technologies (ICT)</li><li>• Health</li></ul>
<b>Multi-college Projects</b>
Projects involving two or more colleges that support CTE programming in: <ul style="list-style-type: none"><li>• Other priority or emerging sectors</li><li>• High-demand occupational clusters</li></ul>
<b>Strengthening Data Use</b>
Projects that build regional capacity for using data, including: <ul style="list-style-type: none"><li>• Participation of all colleges in CTE employment outcomes survey</li><li>• Utilization of labor market information</li></ul>

The remaining \$1.3 million will be allocated directly to each of the Bay Region’s 28 colleges to support self-directed projects aimed at aligning college CTE programs with regional workforce development needs. If the \$3 million allocation for regional and sub-regional multi-college grants is not fully expended, any remaining funds will be rolled over to the direct college allocation share. The CTE Leadership Group approved an **equitable distribution of these funds with each of the 28 Bay Region colleges receiving an allocation of \$46,429**. Any unspent funds from the regional and sub-regional multi-college grants will also be equally divided among the 28 colleges and will augment each college’s \$46,429 allocation.

Proposals are encouraged to address the following regional alignment priorities identified by the Bay

- Regional CTE Pathways**
- Serve mobile students
  - Expand options for students
  - Increase visibility of programs for students and employers
  - Avoid competition
  - Regional advisories
  - Coordinate BA offerings, pathways to BAs
  - Improve ability to use labor market information and employment outcomes data



## Regional Planning

- Bring coherence, longer-term vision to regional efforts
- Cooperation, not competition

## Faculty Engagement

- Shared curriculum, shared curriculum development
- Shared professional development

## Work-based Learning

- Approach regional scale employers to expand internships
- Partner with other stakeholders

## Leadership

- Foster development of CTE leadership

## Industry Engagement

- Coordinated approach to regional scale employers
- Develop ongoing, stable relationships

## Student Access and Success

- Ensure equity of access and success

Deputy sector navigators have played a critical role in convening colleges interested in collaborating - a role very difficult for colleges to do on their own.

Examples of proposals in the works:

- Twenty-three colleges are joining forces to build and staff a centralized, state-of-the-art lab facility hosting a remotely accessible NETLAB+ system serving faculty and students at over 20 colleges. Why should every college pay for and attempt to support this on its own, when this can be done much more efficiently and effectively at scale?
- Seven welding programs will explore bulk purchasing to replace obsolete equipment (that does not serve our students well) with industry standard machines - this with the urging and support of industry partners who have been working with the programs since 2013.

CTE Enhancement Funds are a smart investment at just the right time - capitalizing on the growing investment in regional collaboration to address the high cost of CTE programs, leveraging our significant and, heretofore, untapped scale, and relying on sound labor market and other data to drive smart, efficient investments.

## Central/Mother Lode

The Central/Mother Lode Regional Consortium consists of eight community college districts and thirteen colleges, with two colleges located in the Sierra Nevada foothills and mountain range, and the other eleven located in the Central Valley. The Central/Mother Lode region is one of the largest of the EWD regions; it spans from the San Joaquin Delta College in the north to Cerro Coso Community College in the southeast, a distance of more than 350 miles. It is also one of the poorest regions in the state, with double digit unemployment in seven of the region's ten counties, all of which rank in the bottom ten for the state in unemployment in 2014.

In the face of tremendous challenges, there is an enormous need to attract new employers to the region. The 13 colleges, with their workforce partners, are striving to create training programs that prepare the region's disadvantaged population for high skill, high wage jobs in key industries such as agriculture, advanced manufacturing and health care. They are also helping entrepreneurs start small businesses and learn to export their products, using computerized communications and technology to support all of these sectors. Finally, the economic growth in other parts of the state has led to increased tourism, especially in the Mother Lode sub-region (foothills and Sierra) destinations such as Yosemite and Sequoias National Parks; the colleges are training residents to respond to the need for employees with strong customer service skills and an understanding of the retail, hospitality and tourism industry.

To invest the 40 percent funding, we have agreed that projects need to meet one or more goals defined as high priorities by our region. These priorities include the ones listed below:

- Alignment of curriculum
- Integration of technology
- Embedding soft skills preparation
- Providing work-based learning experiences
- Using data for decision-making

The CEOs of the region, working toward greater collaboration, have decided that each college should participate in the 40 percent regional funding opportunities, so the funds are being apportioned in equal amounts to all 13 colleges. The labor-market center of excellence

(COE) has been instrumental in providing LMI, as well as assistance in understanding employer needs based on surveys and other research reports. Deputy sector navigators have worked closely with the colleges in information communication technology and digital media, agriculture, water and technology, and manufacturing to help design new programs and to provide advice on appropriate technology to support them. The new programs created with the 40 percent funding will be aligned and will be focused on reducing employer-identified gaps in our region's curricular portfolio. The colleges are also going to work on a collaborative approach to developing internship and other work-based learning opportunities that will be across programs. All regional share projects have to be multi-college projects.

Students, employers and colleges will benefit in the following ways:

1. Colleges will be better aligned in how they approach critical training needs in the region, so that students understand the learning outcomes in their programs and employers know what skillsets students have upon completion of programs across colleges.
2. Employers will start to engage with colleges at a deeper level because of their involvement with work-based learning. We will create collective methods in which colleges can interact with employers that are more efficient than the current, singular approach, which will benefit both colleges and employers. In the Central/Mother Lode regional economy, many students have very limited exposure to professional and/or career workplaces, so offering those experiences before they graduate is a powerful means of preparing them for workplace success.

Building capacity to make more effective use of data is one of the regional goals that were decided on early in the planning process for the CTE EF. The consortium is working to build capacity for collaborative data collection and transparency in the data that is made available to colleagues throughout the region. This aspect of the work is one of the most challenging because colleges use different data sources and interpret data differently. Developing some common framework and data sources will enable the colleges within the region to “talk” to one another.

## South Central Coast

The South Central Coast Regional Consortium (SC-CRC) is made up of six districts and eight community colleges. The service areas encompasses the south Central Coast of California including all of Ventura County, north through Santa Barbara County, to San Luis Obispo, east to the northern end of Los Angeles County in Santa Clarita and onward into the Antelope Valley, which comprises an area of over 9,000 total square miles. Home to over 2.2 million people, this region is characterized by small and mid-sized metropolitan communities and expansive rural areas and serves a wide range of industries from aerospace to hospitality to agriculture. The region is economically segmented into three sub-regions with very different demographics and economic drivers.

The South Central Coast Regional Consortium has identified the following sectors as priorities or emerging areas within the region:

- Advanced manufacturing – College of the Canyons (priority)
- Agriculture, water and environmental technologies – (emergent) hosted by Allan Hancock College
- Global trade and logistics – hosted by Santa Barbara City College
- Health care – College of the Canyons (priority)
- Information communication technology and digital media (emergent) – College of the Canyons
- Small business – (priority) – hosted by Cuesta College

The region has been discussing and planning the use of the CTE enhancement funds since the initial discussions at the Chancellor's Office regarding the possibility of this funding. Our strategy for using the 40% was developed with the input of the entire region made of CIOs, CTE and economic development deans, the COE, deputy sector navigators, AB 86 Directors, and the SB 1070 project director over the last several months. The decision was made to use approximately 25 percent of the regional allocation on three regional projects for which consultants would be hired:

1. Identifying and sharing best practices for student success and completion in CTE.
2. Creating and marketing a regional interactive map of programs and services.

### 3. Developing and delivering phase two of CTE faculty training.

The remaining funds will be allocated to each college using the equity model that mirrors the 60% Local Allocation percentages with the focus on data driven projects/initiatives that include at least one other college and/or educational partner. Emphasis was put on sharing curriculum with other colleges, partnering on equipment purchases where feasible, and including high school pathways as much as possible.

Investments will be driven by using COE input on local, regional and statewide data on trending jobs and labor market supply and demand; CTE outcomes survey data; input from the deputy sector navigators and the SB 1070 director on career pathway development ideas for the priority and emerging sectors; building on existing successful and in-demand programs and initiatives that can be expanded to other colleges and/or educational partners; and input from regional workforce investment boards (WIBs), economic development and K-12 partners.

While operationally and geographically challenging to develop and administer across multiple colleges and regions, the data and dialogue-sharing on how to more efficiently and effectively leverage resources to better serve our local, regional and statewide workforce development needs has been invaluable. With continued investments and refined data, the opportunity to be more strategic in how to use CTE investments will provide the greatest return on these investments for students, colleges and employers.

Sample college-share investments:

#### **Antelope Valley College's Proposed Projects:**

##### **1. Project:** Purchase Pipe Welding Equipment

**Summary:** This equipment purchase will enhance the welding program and have a positive effect on the welding, aerospace and transportation manufacturing industries which employs over 3,000 workers in the Antelope Valley. The equipment will also be part of an effort to articulate the Antelope Valley College welding program with the welding curriculum in two high schools in the Antelope Valley Union High School District and the one high school in the Mojave Union High School District.

##### **2. Project:** Purchase a Nursing Simulator

**Summary:** Use of a nursing simulator will enhance the clinical skills of students in the registered nursing program that will have a positive effect on the health care industry in the Antelope Valley and Los Angeles County. Program faculty is willing to collaborate with other nursing programs in the Central Coast Region to develop curriculum that develops students' skills in a multi-patient acute care environment. The simulator is expected to cost more than allocated to Antelope Valley College; therefore, funds from Perkins and the nursing enrollment growth will be braided to fund the cost of the simulator.

#### **Santa Barbara City College's Proposed Project:**

**Project:** Health Data Analytics Certificate for HIT Students/Workers

**Summary:** The Health Information Technology Program at Santa Barbara City College provides online certificates and degrees to students within the South Central Coast Region (and throughout California). The two-year associate degree curriculum is the core educational requirement for the RHIT exam; however, completion of one or more specialty tracks allows graduates more options for specialization. One of the specialty tracks recommended by the American Health Information Management Association (AHIMA) is in health data analytics. Completion of the health data analytics specialty track would provide a path to an additional AHIMA credential: the Certified Health Data Analyst (CHDA) credential. The HIT/CIM Department at Santa Barbara City College would like to offer this track in order to enhance current programs and to assist students in obtaining jobs. Funding from this grant will target the health care sector, and it supports an identified trending job need.

**Details:** This grant will allow for the employment of a consultant to work with our regional partners (employers, colleges, etc.) in reviewing current HIT/CIM courses against the AHIMA-recommended curriculum for the CHDA specialty track; reviewing existing Santa Barbara City College online courses, i.e., CIS, BUS, MGMT, COMP, against the AHIMA-recommended curriculum for the CHDA specialty track; determine

new courses to be developed and complete course outlines for the courses; and research other HIT programs that have developed the CHDA specialty track option and meet with Santa Barbara City College and regional HIT/CIM leadership.

## Los Angeles/Orange County

The Los Angeles-Orange County Regional Consortium is composed of 10 community college districts, comprised of 27 colleges, with an additional district offering noncredit programs only. It is the largest of the seven regional consortia with approximately 34 percent of all community college students in California.

The effort to collectively decide how best to use regional resources has created a shift in thinking for the region. This shift of moving from advocating for an individual college to one of true collaboration and a regional outlook has fundamentally changed the way the colleges work and how they serve students. The regional approach allows better collaboration with partners outside the community college system and ultimately better services for students and communities.

Labor market information and quantitative data has been integral to the regional approach. The Centers of Excellence did research that identified labor market demand for the region and calculations on student graduates from the CTE programs for all of the colleges. The region has also engaged the help of the region's 14 deputy sector navigators and the 10 state sector navigators to help identify common projects in priority and emerging industry sectors. This hard data gave all our regions' colleges the necessary information for them to partner.

Here are examples of collaborations that have been started using the LMI and other quantitative data.

**Energy efficiency:** A good example of this is the work of the energy efficiency and utilities sector navigators and deputy sector navigators in the area of energy efficiency. Six colleges have convened, bringing together faculty, site leadership, and business and industry over the past three months to lay out plans for effectively meeting the needs of this high demand, high skill, and high wage industry sector. Faculty is collaborating on building a common regional competency.

**Multi-college projects:** Another strategy the region has employed was to gather the specifics of the collaborations. The selections of the colleges' focus were made from a list of 40 industry areas and subareas. For example advanced manufacturing was broken down into additive technology, reductive technology, aircraft fasteners, drafting engineering technology, and manufacturing technology. Colleges were then asked to select all those that they had interest in working on and who their partner college would be. The funds were allocated to each college based on the size of their CTE student count. Every college was required to participate in multi-college projects.

## San Diego/Imperial

The San Diego/Imperial Counties Regional Consortium is composed of six community college districts and ten colleges, with one college offering noncredit programs only. Although Imperial Valley College is about 100 miles from the other San Diego County community colleges, the other nine colleges are closely located geographically and all primarily serve one labor market for the region. Both counties have important ties with the global economy via the border with Mexico; priority and emergent sectors are the same, except for agriculture being a strong sector in Imperial Valley.

In collaboration with the San Diego Workforce Partnership (SDWP), the Regional Consortium, and the Center of Excellence (COE), labor market gap analyses were completed in 2014 in key sectors. At the Oct. 2, 2014 Workforce Conference (cosponsored by the Regional Consortium and the San Diego Workforce Partnership, and attended by approximately 300 college and high school/community based workforce training providers), industry panels representing the five priority and emergent sector employers and deputy sector navigators responded to the summarized sector report outcomes and emphasized the need to improve the occupational soft skills in all five sectors. While the reports also indicated the need for such improved soft skills, the employer panels strongly indicated the region should be working to improve this outcome. College CTE program advisory committees for CTE sector occupations have also consistently supported the need for enhanced occupational soft skills. And, the current job postings data for sector occupations include soft skills as essential for applicants.



Utilizing these findings, the regional consortium members worked with their CTE program advisory boards, faculty members and career centers to develop strategies for improving work readiness across the region. The Workforce Development Council, composed of CTE deans and deputy sector navigators as voting members, researched and presented to the group many differing 40 percent proposals over several meetings. Through a voting process, they agreed to develop one regional 40 percent proposal entitled “Strengthening Student Outcomes in Key Sectors” to improve the workforce readiness of students throughout the region. This plan focuses on improving student outcomes, including employment in key sectors by implementing four core components:

### **1. CTE Student Employment Outcomes Survey data**

The region proposes to implement the statewide “CTE Employment Outcomes Survey,” which is currently administered through Santa Rosa Junior College. The proposal will target students in the region’s local share CTE EF key sectors. Data analyzed from survey results will provide vital information for the region’s activities and other initiatives. It will also provide community colleges with a way to improve student outcomes, assess program viability and inform local employers/industry advisory committees. The pilot will focus on key sectors by exploring best practices for improving student response rates, updating student contact information and involving faculty in the process.

### **2. Regional Industry Certification Center (RICC)**

Cuyamaca College will host the Regional Industry Certification Center where college and high school pathway CTE students and incumbent workers will be able to take industry recognized certification and licensure exams. Industry recognized credentials are an important metric in determining the success of our students. Technical industry certification will improve job placements and advancements for students and incumbent workers in the region.

### **3. Regional Occupational Soft Skills Support**

This component will assist in curriculum development and external assessment of occupational soft skills resulting in career readiness certificates utilizing the National Career Readiness Certificate (NCRC) on every campus. The region proposes to develop a re-

gional occupational soft skills infrastructure to build capacity at all regional colleges for the infusion of occupational soft skills into CTE program curriculum through the use of NCRC Work Keys online curriculum modules.

### **4. College career development services**

College career development services will be regionally aligned to enhance occupational soft skills and career readiness training, develop pathways for work-based learning opportunities for students, establish key contact points for business and industry, and increase CTE dean and faculty involvement and collaboration with career development services.

The impact on CTE students and the labor market will include the following:

- Increased connection between business and industry and CTE students through college career development services;
- Regional information on employment outcomes of CTE students to demonstrate success and evaluate with stakeholders;
- Improved work readiness skills of students through the implementation of the NCRC in the region;
- Enhanced student access to cost-effective testing for industry recognized certifications; and
- Increased numbers of new and incumbent employees receiving certifications in soft and technical skills.

## **Inland Empire**

The Inland Empire Regional Consortium includes 12 community colleges in San Bernardino and Riverside Counties. The region is large, encompassing 27,311 square miles. The Inland Empire is in great need of an educated and skilled workforce. A mere 12 percent of the population holds a bachelor’s or graduate degree while 13 percent have never graduated from high school. Only 5 percent of the population holds an associate degree and 31 percent have either graduated from high school or have some college education. In 2010, the area recorded a record unemployment rate of 14.3 percent, and in 2012 the poverty levels hovered between 16 percent and 20 percent.

Educators play a key role in economic recovery and prosperity by preparing residents for positions in careers with a livable wage. From June 2014 through

January 2015, the region's community college CEOs, CIOs, CTE deans, deputy sector navigators, Centers of Excellence director and regional consortium chair collaborated to produce a proposal for an integrated workforce development program in the Inland Empire. The region will align its 40% investments in support of this collaborative approach with the overall goals of:

- Addressing critical labor market shortages in the Inland Empire by preparing students for high demand occupations and careers with livable wages;
- Facilitating transitions into identified educational pathways;
- Decreasing unemployment by providing streamlined paths to high demand occupations and careers;
- Increasing the number of college completers in high demand labor market sectors; and,
- Sharing best practices and resources among the region's workforce development partners.

The consortium has identified a number of key strategies to support this integrated program, including these listed below:

- **Partnerships:** Working with partner agencies such as the WIBs, economic development agencies, K-12, public and private four-year colleges and industry organizations.
- **Pathways and curricular alignment:** Developing and enhancing streamlined educational pathways from K-12 (including adult education) to community colleges (including credit, noncredit, and not-for-credit) to baccalaureate programs where appropriate. Special attention will be given to stackable programs with consistent curriculum across the region that is based on industry standards.
- **Innovating and piloting:** Sharing lab facilities and equipment; utilizing mobile labs and regional simulation centers; supporting the regional manufacturing training center Trade Adjustment Assistance Community College and Career Training federal grant (TAAACCT project); and exploring digital badging.
- **Outreach:** Providing information to parents and students about high demand pathways for the purpose of encouraging enrollment, completion and employment.

The region's community colleges will each receive an equal share of the 40% funds and will collaborate with a minimum of one other regional college to implement one or more key strategies identified above within a specific industry sector pathway. Pathways within each industry sector were selected based on current labor market data provided by the Centers of Excellence, various industry specific research and employer surveys. Sectors include health care, specifically, nursing – LVN to RN to BSN, EMT and paramedic, respiratory care, radiologic technology, and dental hygiene; logistics, specifically, logistics management/supply chain management and automated systems/supply chain technology; advanced manufacturing; advanced transportation. In addition, ICT/digital media and small business/entrepreneurship will be infused in curriculum across-these sectors.

## **60% Local Applications in Ten Priority Industry Sectors**

In addition to the 40% Regional application, community colleges applied the 60% Local application in ten priority industry sectors. Working with the deputy sector navigators in these industry sectors, colleges applied funds toward those programs that best fit the identified needs for skilled employees within these industries. While each industry sector faces unique demands and challenges, CTE programs in these sectors share many challenges and opportunities across sectors. The largest funding challenge for all industry sectors except for small business and global trade and logistics is to keep up with new equipment and upgrades. Employers want to hire employees who have training and experience on the latest technology. Most of the funds for the 60% Local applications went toward new equipment and upgrades. Since technology across sectors continues to change rapidly, funding for new equipment and upgrades needs to be continuous to keep up with demand. In addition, faculty needs continuous training to keep up with the latest trends and technologies in their respective fields.

## Advanced Manufacturing:

Create efficient yet flexible production systems using and advancing computer and information technologies to serve changing customer production needs

Foreign and out-of-state domestic competitors are becoming more agile in adoption of automation and technology. Contracting decisions by companies seeking new product production supply from original equipment manufacturers often become a matter of who can tool-up first with a ready workforce and with the newest, fastest technology at the lowest cost, thereby changing the advanced manufacturing sector landscape and reshaping jobs. These jobs require advanced manufacturing sector employees to have more advanced skills, e.g. operating and maintaining computerized machinery as well as performing complex tasks and calculations to improve manufacturing processes. Additionally, these jobs require critical thinking, problem solving, communication, collaboration, creativity and innovation. Furthermore, these required skills are the same skills needed in other sectors such as utilities or transportation, making them portable and transferrable.

The cost to set-up and the ongoing operating costs to maintain a modern training facility are significant and difficult to support via traditional funding mechanisms. An appropriate funding model that takes into account the added expense of CTE training like computer numerical control machines, laser scanners, coordinate measuring machines, etc. is needed. Also, many CTE classes require small class sizes to assure quality hands-on time with the equipment. Addition-

ally, access to or development of new curricula, as well as maintaining a qualified instructional staff which are well connected to industry, is difficult.

- Sierra College will meet in-demand training needs for advanced manufacturing occupations in the North Region by enhancing students' abilities to develop and test applied concepts and prototypes. The integration of MasterCAM software into CTE curriculum will support SB 70/1133 investments at four feeder high school programs in advanced manufacturing that offer introductory MasterCAM and computer numerical control fabrication courses. The purchase and placement of the computer numerical control equipment will strengthen cross-discipline collaboration in four CTE programs of study and strengthen alignment with high school advanced manufacturing, construction and engineering pathways.
- Sourcing maintenance mechanics, instrumentation technicians, and process control technicians with a strong knowledge of electrical, automation, process control and robotics is a big challenge for the employers within the Central Region. Furthermore, college program offerings are structured mainly to prepare students with one core focus (e.g. welding, machining) and the programs are offered mostly to serve full-time students. Funds at Porterville College

Advanced Manufacturing			
CA Region	Number of Colleges Investing	Total Investment	% of Region's Investment in this Sector
Bay	10	\$928,557	14.5%
Central/Mother Lode	10	\$862,031	31.7%
Inland Empire	5	\$467,532	20.7%
Los Angeles/Orange County	17	\$3,104,437	32.6%
North/Far North	6	\$848,931	28.4%
San Diego/Imperial	6	\$580,247	23.4%
South Central Coast	4	\$232,237	11.1%
<b>TOTAL ADVANCED MANUFACTURING</b>	<b>58</b>	<b>\$7,023,971</b>	<b>24.7%</b>
Over 90 percent of the total investment in the advanced manufacturing sector is to be spent on new equipment and upgrades: computer numerical control machines, laser cutters, computer workstations with latest CAD/CAM software, 3-D printers and scanners, ShopBot, industrial table saws, laser/robotic welders, etc.			

## Top Employers for Advanced Manufacturing from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Airgas	National Training Center (NTC) at Fort Irwin	SMUD
Edwards Air Force Base	PASCO Scientific	TSI Semiconductors
Esko-Dupont	Patton Group	Two Dog Star
First Solar	Paulson Manufacturing	US Shop Tools
Levi Strauss	RC Machine and Tool	Vista Industrial Products
Lockheed Martin Corporation	Schilling Robotics	West Marine
Marine Corps Logistics Base (MCLB)	Sierra Pacific Industries	

## TOP Codes for Advanced Manufacturing from the 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Title	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certifications	Noncredit Awards	Total Awards	Total FTES (Credit and Noncredit)
0901	Engineering, General	304	26		330	1,739
0934	Electronics and Electric Technology	361	1,151	59	1,571	4,200
0935	Electro-Mechanical Technology	4	18		22	108
0936	Printing and Lithography	11	31		42	258
0945	Industrial Systems Technology and Maintenance	30	157		187	286
0946	Environmental Control Technology (HVAC)	121	691	262	1,074	2,199
0953	Drafting Technology	207	450		657	3,452
0954	Chemical Technology	3	2		5	230
0956	Manufacturing and Industrial Technology	222	1,072	134	1,428	7,139
0999	Other Engineering & Related Industrial Technologies	40	47		87	322
<b>TOTAL Advanced Manufacturing Programs</b>		<b>1,304</b>	<b>3,644</b>	<b>455</b>	<b>5,402</b>	<b>19,933</b>

**Source:** California Community Colleges Chancellor's Office DataMart



will be used to complete and implement curriculum for a logistics management program. The program will use existing as well as a newly developed curriculum focusing on integrated logistics, a necessity for management of effective and efficient supply chains. Areas covered include warehousing, operations supply chain, transportation, global logistics and transportation, and service contracting. College of the Sequoias will upgrade ever-changing technology within the areas of manufacturing, welding and industrial maintenance including: upgrading power needs for welding; improving pneumatic technologies in welding; purchasing updated equipment for the motor control laboratory and a new lathe, providing faculty training in robotics, and professional development with the National Center for Construction Education and Research (NCCER) and fostering industry partnership development for internships within industrial maintenance and welding technology.

- Los Angeles County is still the nation's leader in advanced manufacturing, in terms of revenue and number of jobs. To maintain a part of their com-

petitive advantage, advanced manufacturers in the region are seeking a workforce that is better able to adopt new technologies and automation-initiatives quickly. These employers are looking to the community colleges to provide well-trained, ready-to-work technicians in a manner consistent with demand. Employers view community college programs as a resource for entry level workers. Employers also look to the community colleges as a resource on a continuous basis to lead in the up-skilling of incumbent workers to provide skills that facilitate long-term and economically sufficient employment. Cerritos College plans to purchase several 3-D printers including clay, composite and plastic materials plus 3-D scanners and associated software for reverse engineering applications as well as product design. Those tools will be used in collaboration with the machine tool technology, plastics and composites, and computer numerical control woodworking departments. LA Trade-Technical College is planning to upgrade existing computer numerical control machines in order to work with composite materials to meet aerospace industry standards.

### Top 10 Occupations in Advanced Manufacturing from the 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
49-9071	Maintenance and Repair Workers, General	133,649	4,736	\$19.84	\$11.03	\$18.54
51-4041	Machinists	38,052	1,364	\$19.92	\$10.62	\$18.65
51-4121	Welders, Cutters, Solderers, and Brazers	29,203	997	\$19.68	\$11.66	\$18.25
49-9041	Industrial Machinery Mechanics	22,392	1,228	\$26.58	\$15.99	\$26.12
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	9,117	407	\$18.78	\$11.69	\$17.83
17-3029	Engineering Techs, Except Drafters, All Other	9,096	286	\$30.83	\$17.54	\$30.84
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	6,587	175	\$27.13	\$15.57	\$27.48
17-3013	Mechanical Drafters	4,487	103	\$28.12	\$17.37	\$26.70
17-3024	Electro-Mechanical Technicians	2,733	65	\$26.54	\$15.71	\$23.35
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	2,580	142	\$27.37	\$15.65	\$26.95
	<b>Total</b>	<b>257,897</b>	<b>9,503</b>	<b>\$21.25</b>	<b>\$12.04</b>	<b>\$20.10</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

## Information Communication Technology/Digital Media (ICT/DM):

Encompasses all rapidly emerging, evolving and converging computer, software, networking, telecommunications, Internet, programming and information systems technologies including hardware, software, digital media and services

The information communication technology industry sector has several unique workforce development challenges and opportunities which are being addressed across the state by proposed investments in the 60% CTE Enhancement funds. Information technology training involves computer networking laboratory lessons. Advances in technology now allow this to occur effectively as a virtual 24/7 application simulating most networking challenges. Funding for the NetLabs+ product to do this has become a great opportunity to train hundreds of students each semester. Software for both computer science and digital media needs to be upgraded and refreshed every few years to be relevant to the workforce requirements. Faculty must be the subject matter experts in the classroom and with rapidly changing technology, this requires annual training.

- Multiple grants funded the purchase of NetLabs+ equipment for IT networking training. With 24/7 availability the cost of faculty in the lab and the number of student seats is effectively cut 80 percent. Furthermore, with a CCC NetLabs User-Group sharing best practices and curriculum, the effectiveness of the program is expanded significantly. Many grants are funding a hub sharing

arrangement where one college hosts the needed NetLabs+ equipment for several neighboring colleges, thereby saving even more.

- Software, equipment and faculty training need to be responsive to regional workforce needs. Multiple grants are funded to replace the software most relevant to the region's economic growth. Software applications and equipment relevant to entertainment digital media applications are funded in Los Angeles, while software appropriate for application and programming is under development in San Francisco.

Information Communication Technology/Digital Media (ICT/DM)			
CA Region	Number of Colleges Investing	Total Investment	% of Region's Investment in this Sector
Bay	18	\$2,066,695	32.3%
Central/Mother Lode	4	\$90,705	3.3%
Inland Empire	9	\$510,531	22.6%
Los Angeles/Orange County	18	\$2,136,009	22.4%
North/Far North	5	\$278,596	9.3%
San Diego/Imperial	5	\$647,104	26.1%
South Central Coast	5	\$429,846	20.6%
<b>TOTAL ICT/DM SECTOR</b>	<b>64</b>	<b>\$6,159,486</b>	<b>21.6%</b>
Over 80 percent of the total investment in ICT/DM is to be spent on new equipment and upgrades: computers, laptops, hard drives, music, audio and video labs, routers, monitors, color scanners and printers, tablets, camera packages, memory, microphones, projection systems, computing carts, servers, virtualization upgrades, etc.			

## Top Employers for ICT/DM Occupations from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Apple Inc.	E! Entertainment Television, LLC	Livermore National Laboratory
Bay Area Rapid Transit	Edwards Air Force Base	MTV
Cartoon Network	FedEx	NBCUniversal, Inc.
Cisco	Hewlett-Packard	Pixar
County of San Bernardino Information Services Department	IBM Corporation	Southern California Edison
Dell Incorporated	Industrial Light and Magic	U.S. Forest Service
Disney Studios	Kaiser Permanente	

## TOP Codes for ICT/DM from 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Titles	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certificates	Noncredit Awards	Total Awards	Total FTES
07XXXX	Information Technology	1,089	1,823	119	3,031	30,758
0614XX and 00607XX	Digital Media & Technical Communication	336	616	13	966	7,164
220610	Geographic Information Systems	157	102	0	259	365
<b>Total</b>		<b>1,582</b>	<b>2,541</b>	<b>132</b>	<b>4,255</b>	<b>38,287</b>

Source: California Community Colleges Chancellor's Office DataMart

## Top 10 ICT/DM Occupations from 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
15-1132	Software Developers, Applications	99,741	4,994	\$53.39	\$31.93	\$51.35
15-1151	Computer User Support Specialists	70,340	3,123	\$27.79	\$15.47	\$25.85
15-1121	Computer Systems Analysts	69,172	3,266	\$43.34	\$27.34	\$41.37
15-1142	Network & Computer Systems Administrators	44,635	1,638	\$40.84	\$24.34	\$39.37
15-1131	Computer Programmers	44,009	1,911	\$41.39	\$22.25	\$40.35
27-1024	Graphic Designers	42,770	1,536	\$23.99	\$15.03	\$22.48
15-1134	Web Developers	23,291	1,229	\$31.35	\$16.05	\$30.45
15-1152	Computer Network Support Specialists	20,613	683	\$36.49	\$21.22	\$34.87
27-1014	Multimedia Artists and Animators	16,589	548	\$30.72	\$16.29	\$28.73
27-4032	Film and Video Editors	10,712	230	\$39.78	\$17.96	\$34.74
	<b>Total</b>	<b>441,872</b>	<b>19,159</b>	<b>\$39.30</b>	<b>\$22.96</b>	<b>\$37.51</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

## Health:

Comprises health care occupations in ambulatory health care services, nursing and residential care facilities and hospitals

The health sector has several unique workforce development challenges and opportunities which are being addressed across the state by proposed investments in the 60% CTE Enhancement Fund allocation. Based on the recent HWI labor market survey, 68.5 percent of those responding indicated they are more likely to hire an RN with a baccalaureate degree in nursing. This mirrors the Institute of Medicine report recommending that by 2020, 80 percent of nurses should have a baccalaureate degree. Laboratory services and the advanced modalities in diagnostic imaging have been the most challenging for industry from a staffing perspective. The health care industry continues to request increased training in soft skills for increased worker competency in the new environment created by the Affordable Care Act.

- The Cardiovascular Technician Program at Grossmont College is the only program of its kind in San Diego County. Equipment for the program is extremely costly, and the life expectancy of the equipment is only three years due to rapid changes in technology. This grant will provide all echo and vascular students with the ability to practice their skills on a machine that local hospitals are presently using, thereby reducing the time necessary for training. Students from this program are recruited, often before they graduate, by employers in the county and from all over the country.
- San Diego Mesa plans on using the funds for the Radiologic Technology Program. The RadCare bill requires technologists to now be licensed and certified in the advanced modalities. Mesa College has the X-ray equipment and regional partnerships to offer this training to students currently enrolled in the program and to incumbent workers needing this certification. The advisory board has been requesting Mesa College to do this training for the last five years. They have the high-tech facility, but need the software for these programs. Offering this training regionally will provide a way for our business partners to get the training for their workers without having to send them out of state. Students taking this additional training while in the program will have a huge advantage when applying for positions once they have passed the national exam for general radiology and the additional advanced modalities.
- College of the Canyons will use the funds to provide students of the Emergency Medical Services Program with an ambulance simulator. Used in tandem with a human patient simulator, both units will provide students with improved simulated clinical experiences. They will help to increase critical thinking skills and offer hands-on lifelike scenarios, such as the experience of riding in the

Health			
Bay	19	\$1,002,795	16.5%
Central/Mother Lode	7	\$661,580	25.8%
Inland Empire	6	\$381,387	18.1%
Los Angeles/Orange County	13	\$1,244,025	14.9%
North/Far North	6	\$473,159	16.6%
San Diego/Imperial	5	\$545,157	22.4%
South Central Coast	7	\$811,797	45.6%
TOTAL HEALTH CARE SECTOR	63	\$5,119,900	19.6%
About 82 percent of the total investment in the health sector is to be spent on new equipment and upgrades: simulators and simulation laboratories, manikins, medical lifts, ER crash carts, ultrasound machines, dental chairs, glucometers, stretchers, defibrillators, ventilators, computers and software, EKG monitors, hospital beds, digital X-ray machines, phlebotomy equipment, etc.			



## TOP Codes for Health from 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Titles	Three-Year Averages 2011-14				
		Associate Degrees	Credit Awards	Noncredit Awards	Total Awards	Total FTES
1201	Health Occupations, General	155	118	45	318	1,556
1202	Hospital and Health Care Admin.	1	1		2	1
1205	Medical Laboratory Technology	65	121		186	308
1206	Physician's Assistant	40	64		104	444
1208	Medical Assisting	274	883	119	1,276	2,184
1209	Hospital Central Service Technician		20		20	15
1210	Respiratory Care/Therapy	396	65		461	1,501
1211	Pharmacy, General	6			6	10
1212	Electro-Neurodiagnostic Technology	11			11	40
1213	Cardiovascular Technician	53	31		84	239
1214	Orthopedic Assistant	7	17		24	27
1215	Electrocardiography	7	63		70	69
1217	Surgical Technician	20	31		51	132
1218	Occupational Therapy Technology	77			77	296
1220	Speech/Language Pathology and Audiology	103	27		130	246
1221	Pharmacy Technology	101	192	81	374	759
1222	Physical Therapy Assistant	96			96	341
1223	Health Information Technology	155	234		389	1,064
1225	Radiologic Technology	434	181		615	2,650
1226	Radiation Therapy Technician	7	2		9	77
1227	Diagnostic Medical Sonography	49	43		92	342
1228	Athletic Training and Sports Medicine	34	6		40	268
1230	Nursing	5,461	1,796	388	7,645	21,057
1239	Psychiatric Technician	102	428		530	1,451
1240	Dental Occupations	432	544	5	981	2,637
1250	Emergency Medical Services	15	1,524		1,539	4,465
1251	Paramedic	94	557		651	1,165
1255	Mortuary Science	57			57	154
1260	Health Professions, Transfer Core Curriculum	654	30		684	929
1261	Community Health Care Worker	7	103		110	68
1262	Massage Therapy	12	75		87	177
1270	Kinesiology	98			98	1,561
1299	Other Health Occupations	1	67	50	118	443
<b>TOTAL HEALTH PROGRAMS</b>		<b>9,024</b>	<b>7,223</b>	<b>688</b>	<b>16,935</b>	<b>46,676</b>

Source: California Community Colleges Chancellor's Office DataMart

back of an ambulance.. The enhanced program should lead to an improvement in patient care outcomes thanks to the equipment and devices purchased with the funds. The added equipment will also provide an option for lost clinical opportunities due to displacement and for use with students found deficient in knowledge, skills and abilities.

- Sacramento City College applied for a CTE Enhancement Fund allocation for its program in dental hygiene. The application requested funds to upgrade the dental clinic and the dental steriliza-

tion lab, repair 11 dental chairs and purchase eight additional chairs. Dental hygiene is a high cost program in terms of both capital expenditure and daily operating costs. This investment will ensure students are taught on industry standard equipment while observing appropriate safety precautions.

### Top Employers for Health Occupations from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Antelope Valley Hospital	Natividad Medical Center	Sequoia Hospital
Bayer	Palo Verde Hospital	Sharp Healthcare
Central Coast Dermatology	Pasadena Fire Department	Shasta Community Dental Clinic
Good Samaritan Hospital	Pocket Nurse	Sutter Health
El Camino Hospital	Riverside County Regional Medical Ctr.	Walgreens
Kaiser Permanente	Santa Clara Valley Medical Center	USC-Verdugo Hills Hospital
Loma Linda VA Hospital	Scripps Mercy	

### Top 10 Health Occupations from 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
29-1141	Registered Nurses	261,092	11,429	\$46.36	\$30.48	\$45.10
31-1014	Nursing Assistants	106,303	5,865	\$14.31	\$9.97	\$13.52
31-9092	Medical Assistants	85,242	4,221	\$16.51	\$10.70	\$15.85
31-1011	Home Health Aides	68,621	6,017	\$12.18	\$8.72	\$11.00
29-2061	Licensed Practical and Vocational Nurses	65,026	3,821	\$24.91	\$17.57	\$24.82
31-9091	Dental Assistants	46,863	2,021	\$18.14	\$11.92	\$17.58
29-2041	EMT & Paramedics	17,944	1,204	\$16.98	\$9.48	\$14.23
29-2034	Radiologic Technologists	15,501	671	\$34.69	\$20.43	\$34.01
29-1126	Respiratory Therapists	14,322	429	\$36.48	\$25.92	\$36.24
31-2021	Physical Therapist Assistants	4,790	348	\$29.52	\$19.53	\$30.60
	<b>Total</b>	<b>685,704</b>	<b>36,026</b>	<b>\$28.94</b>	<b>\$19.22</b>	<b>\$28.01</b>

**Source:** EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

## Advanced Transportation and Renewables:

Ensure that California maintains its role as a clean technology world leader in a rapidly changing global environment with competitive, efficient and environmentally clean transportation and energy industries

The principal challenge in the advanced transportation and renewables (ATRE) sector is that ongoing technological advancement is required to keep it effective, efficient and environmentally clean. Knowing when and how to provide technical training is as critical as determining the needed improvements to that training in order to keep pace with changing fuels, vehicles, diagnostics, technology and the interface between them. For example, a number of technological developments, changes in customer expectations, and increasing environmental and safety regulations have resulted in a rapid evolution of automobile technology in the past five years. There are a growing number of electric and hybrid-electric vehicles on the road today with manufacturers introducing new models each year, increasing interactions with local electrical distribution systems and requiring the building of integrated electrical systems. On-board electronics have also expanded into extensive “Infotainment” systems (as customers want choices and connectivity) and into systems to improve safety. Examples of the latter include systems to provide automatic braking, lane detection, blind spot detection and collision avoidance.

The opportunity and challenge for career technical education deans, chairs and faculty is to keep pro-

grams relevant to the most current skills needed by employers. ATRE is working with a number of these colleges, as well as feeder high school programs, to conduct professional development training for faculty, to integrate curriculum for electric vehicle and hybrid vehicle instruction, and to build the nexus between automotive and energy technical training programs. However, there is an increasing gap in the ability to provide industry technical skill training and the resources needed to deliver quality hands-on training. The need to provide the lab environments with sufficient equipment, training kits, and diagnostic hardware and software as well as provide faculty with up-to-date knowledge to teach these emerging technologies is growing nearly impossible to fit into on-going budgets.

- De Anza College’s Energy Systems Technology Program is using the CTE Enhancement Fund allocation to develop new course curriculum for solar and wind energy and fuel cell technology. This is part of their broader effort to install and provide instruction related to micro-grids and related technologies. Given the crucial importance of addressing industry skill needs, both equipment acquisition and curriculum development present challenges for CTE program

### Advanced Transportation and Renewables

Bay	8	\$439,714	6.9%
Central/Mother Lode	0	\$0	0.0%
Inland Empire	5	\$433,764	19.2%
Los Angeles/Orange County	8	\$709,324	7.5%
North/Far North	3	\$231,342	7.8%
San Diego/Imperial	6	\$305,520	12.3%
South Central Coast	2	\$45,000	2.2%
TOTAL	32	\$2,164,664	7.6%

Over 88 percent of the total investment in ATRE is to be spent on new equipment and upgrades: lithium batteries, electric charging stations, hoists, Prius transmissions, diesel trainers, diagnostic equipment and software, rail systems simulation technology equipment, computer numerical control systems, hydraulics trainer, HVAC technical training unit, etc.

enhancement. Classroom trainers and associated lab equipment typically cost in the tens-of thousands of dollars. Industry workforce skills panels need to be held in order to identify required skills and associated technical education. Then feedback needs to be integrated into classroom and lab curriculum. Faculty time is needed throughout this process. In addition, the faculty seek to integrate other critical energy components into the program, including green electronics, environmental monitoring technology and energy auditing. This requirement for diverse skills frequently requires outside specialist assistance on a fee-basis as professional volunteers are not always available.

- The San Diego Community College District and San Diego Metropolitan Transit work together to foster an effective apprenticeship program. MTS, a regional employer, has identified a key component of the heavy-duty advanced transportation curriculum that has been deficient, particularly for effective hands-on technical training. To date, the training on the bus heating, ventilation and air conditioning systems has been taught through a building focused HVAC program of study. Through CTE enhancement funding, the needed lab equipment will be purchased and faculty provided appropriate professional development to effectively improve the curriculum and thereby the technical training of the apprentices. This equipment will effectively add an additional

component to the overall quality of the program and also improve the technical training for students seeking employment at fleets and industry throughout the region.

- The East Los Angeles College grant application for equipment purchases and curriculum development sets forth important program information and explains how the added investments will address industry and pathway technical training needs. Based upon industry needs and requirements, the program addresses a pathway approach via a “2 +2+2” program, including details on its articulation between the education partners. Multiple pathways are set forth to demonstrate how students will be prepared for and able to demonstrate the necessary entry level workforce skill requirements. They explain what alternative fuels is in general terms for others to understand. They outline designing, manufacturing and testing in the alternative fuels sector. The program demonstrates multiple pathways for a student to meet the needs of the industry in our region.

### Top Employers for Advanced Transportation and Renewables Occupations from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Abengoa Solar	Enphase	NRG Energy
Bay Area Air Quality Management District	First Solar	Parker Hannifin
BrightSource	Grid Alternatives	Solar City
CalEnergy	Guardian Glass	South Coast Air Quality Management District
California Energy Commission	Hydro Aluminum	Southern California Gas Company
California’s 13 Clean Cities Coalitions	Iberdrola Renewables	Southern California Edison
CLP Skilled Trades Solutions	NextEra Energy Resources	



## TOP Codes for Advanced Transportation and Renewables from 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Titles	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certificates	Noncredit Awards	Total Awards	Total FTES
0947	Diesel Technology	49	360		409	1,092
0948	Automotive Technology	388	2,758	213	3,359	10,035
0949	Automotive Collision Repair	39	250	98	387	1,654
0950	Aeronautical and Aviation Technology	100	482		582	1,778
0956	Manufacturing and Industrial Technology	222	1,071	134	1,427	7,139
<b>TOTAL ATR Programs</b>		<b>799</b>	<b>4,920</b>	<b>444</b>	<b>6,163</b>	<b>21,698</b>

Source: California Community Colleges Chancellor's Office DataMart

## Top 10 Advanced Transportation and Renewables Occupations from 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
49-3023	Automotive Service Technicians & Mechanics	75,890	2,547	\$18.41	\$10.28	\$17.27
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	42,408	1,620	\$34.68	\$20.58	\$33.63
49-3031	Bus and Truck Mechanics & Diesel Engine Specialists	23,534	818	\$22.99	\$14.55	\$22.71
49-3021	Automotive Body and Related Repairers	15,238	433	\$19.43	\$11.54	\$17.85
49-3011	Aircraft Mechanics and Service Technicians	12,993	554	\$30.08	\$19.36	\$29.98
49-3042	Mobile Heavy Equipment Mechanics except Engines	12,214	468	\$25.74	\$16.59	\$25.46
51-9122	Painters, Transportation Equipment	7,199	151	\$20.30	\$12.86	\$18.43
49-2091	Avionics Technicians	1,813	60	\$30.98	\$16.84	\$32.54
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	1,469	14	\$16.08	\$9.00	\$15.72
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	1,348	39	\$28.16	\$19.84	\$27.62
	<b>Total</b>	<b>194,107</b>	<b>6,704</b>	<b>\$24.08</b>	<b>\$14.36</b>	<b>\$23.16</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

## Agriculture, Water and Environmental Technologies:

Encompasses four clusters: Agriculture support, agriculture production, agriculture wholesale trade, and agriculture water and environmental services

Not only is the agriculture, water and environment technologies sector essential, but the growth in innovation within the sector plays an important role by fueling product and technology innovations in the state (in areas such as electronics, energy, plastics and pharmaceuticals)<sup>1</sup>. Therefore, updated equipment and machinery is critical to ensure that students are gaining skills that are meeting current industry needs. In addition, agriculture faculty and partners collaborate and work well together, benefiting students. The focus on sustainability and the environment necessitates teaching students the latest technologies and practices requiring up-to-date equipment and curriculum.

Welding, horticulture, agriculture fabrication and other programs are continuing to train students who are able to go to work right after completion. Using these funds

to provide updated equipment and curriculum ensures that our students are equipped with the latest and most current skills as it relates to their industry and career.

- Feather River College is converting a welding shop to an agriculture fabrication and mechanics shop which will model conditions and equipment used on a typical modern California farm or ranch.
- For its mechanized agriculture heavy equipment and diesel truck maintenance programs, Modesto Junior College is purchasing modern diesel truck equipment and technology for its lab.
- Some colleges in the Bay Region are making investments in the food science area, purchasing fermentation and winery equipment and cold ultra-juice pasteurizer.

<sup>1</sup> DWM Sector Profile: [http://www.coeccc.net/documents/dwm\\_ag\\_sector\\_CA\\_12.pdf](http://www.coeccc.net/documents/dwm_ag_sector_CA_12.pdf)

Agriculture, Water and Environmental Technologies			
Bay	7	\$ 449,962	7.0%
Central/Mother Lode	7	\$ 594,480	21.8%
Inland Empire	1	\$ 33,675	1.5%
Los Angeles/Orange County	1	\$ 39,000	0.4%
North/Far North	6	\$ 376,406	12.6%
San Diego/Imperial	0	\$0	0.0%
South Central Coast	3	\$ 102,500	4.9%
TOTAL	25	\$ 1,596,023	5.6%

Over 82 percent of the total investment in the agriculture, water and environmental technologies sector is to be spent on new equipment and upgrades: fermentation equipment, microscopes, glycol heater/chiller, cold ultra-juice pasteurizer, mowers, greenhouses, Bobcat, water reclamation systems, turf aerator, walk-in refrigerators, computers, forklifts, diesel engines, hydroponics and aeroponics systems, tractors, hydraulics lab, etc.

Top Employers for Agriculture, Water and Environmental Technologies Occupations from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs		
AGCON	Guy Rents	Napa Valley Vintners
Anheuser-Busch	Lagunitas	Sierra Pacific Industries
Broucaire Landscaping	Lincoln	Sysco
CA State Florists Association	Miller	Trumer Pils
Conservation Corps North Bay	Mojave Water Agency	
Downtown Joes	Napa Valley Fermentation	

## TOP Codes for Agriculture, Water and Environmental Technologies from 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Titles	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certificates	Noncredit Awards	Total Awards	Total FTEs
0101	Agriculture Technology & Sciences, General	65	21		86	586
0102	Animal Science	261	130		391	1,971
0103	Plant Science	22	34		56	889
0104	Viticulture, Enology, and Wine Business	34	27		61	288
0109	Horticulture	153	335	51	539	2,116
0112	Agriculture Business, Sales and Service	81	53		134	346
0113	Food Processing & Related Technologies		4		4	11
0114	Forestry	22	34		56	300
0115	Natural Resources	56	44		100	729
0116	Agricultural Power Equipment Technology	10	85		95	386
0199	Other Agriculture and Natural Resources	9	7		16	44
0958	Water and Wastewater Technology	106	302		408	778
<b>TOTAL AG, Water, Environmental Tech Programs</b>		<b>818</b>	<b>1,077</b>	<b>51</b>	<b>1,946</b>	<b>8,445</b>

Source: California Community Colleges Chancellor's Office DataMart

## Top 10 Agriculture, Water and Environmental Technologies Occupations from 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
37-3011	Landscaping and Groundskeeping Workers	169,361	6,544	\$12.89	\$9.24	\$11.94
11-9013	Farmers, Ranchers and Other Ag Managers	37,533	616	\$24.13	\$15.17	\$23.35
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	23,534	818	\$22.99	\$14.55	\$22.71
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Grounds keeping Workers	18,516	419	\$19.09	\$12.84	\$18.35
45-2091	Agricultural Equipment Operators	15,972	674	\$11.57	\$8.46	\$10.52
49-3042	Mobile Heavy Equipment Mechanics except Engines	12,214	468	\$25.74	\$16.59	\$25.46
51-8031	Water and Wastewater Treatment Plant & System Operators	10,710	594	\$30.51	\$19.08	\$30.26
19-4011	Agricultural and Food Science Technicians	3,678	192	\$16.54	\$10.59	\$15.62
49-3041	Farm Equipment Mechanics and Service Technicians	3,180	107	\$19.63	\$12.10	\$19.40
19-1012	Food Scientists and Technologists	2,494	133	\$30.44	\$17.19	\$27.94
	<b>Total</b>	<b>297,193</b>	<b>10,565</b>	<b>\$16.85</b>	<b>\$11.36</b>	<b>\$16.03</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

## Small Business:

Businesses that are independently owned and operated, organized for profit and not dominant in their field<sup>2</sup>

There is an opportunity to provide small business and entrepreneurship education embedded or infused into existing CTE programs so that in addition to the technical skills for a particular CTE field, students can also learn the business skills to make them better employees as well as prepare them to become future potential owners.

One of the challenges for the small business sector is tracking the success of efforts to infuse or embed small business and entrepreneurship education into CTE programs. Current metrics are based on wage related data tracked through the Employment Development Department and metrics related to business ownership or self-employment are more difficult to track since self-employed people do not report their earnings through the department, but through the Franchise Tax Board as business income.

- College of the Canyons proposed that grant funding be used to move its culinary arts program into a new building on campus from an off-campus location. This expansion will allow the college to offer more courses and serve more students. The new facilities will include four kitchens (there is only one kitchen in the current facility), a new

pizza oven, a chocolate room and an enhanced wine studies classroom. The increase in students served will help reduce the need for trained cooks and front-of-the-house personnel at hotels and restaurants in the community. Students will no longer have to leave the community to receive more advanced training that will make them competitive in the industry.

- Santa Rosa Junior College proposed a small business and entrepreneurship focused grant application to work with industry leaders to develop curriculum based on current industry needs, revitalize or develop programs in the fields of human resources, enrolled agent (tax preparation), business management (retail, supervision, and administration), business office technology, and hospitality. Business and entrepreneurship has been identified as a priority sector in the North Bay along with hospitality and tourism. Sonoma County is a competitive place to do business both because of an attractive business climate and the high quality of life. Sonoma County had the third-highest number of business establishments per capita among comparable counties. Expected outcomes include improved and updated curric-

<sup>2</sup> Definition of a small business by the Small Business Administration

Small Business			
Bay	6	\$118,851	1.9%
Central/Mother Lode	4	\$154,200	5.7%
Inland Empire	1	\$13,598	0.6%
Los Angeles/Orange County	3	\$538,339	5.7%
North/Far North	2	\$33,000	1.1%
San Diego/Imperial	1	\$40,000	1.6%
South Central Coast	5	\$310,125	14.8%
TOTAL	22	\$1,208,113	4.2%
Over 39 percent of the total investment in the small business sector is to be spent on new equipment, upgrades, and materials: computers, printers, copiers, scanners, software, storage carts, iPads, training and marketing materials, etc.			
Nearly 42 percent of the total investment in the small business sector is to be spent on faculty and staff time for a multi-discipline approach to developing curriculum, for professional development and for the creation of print and video marketing tools.			



## Top Employers for Small Business Occupations from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Backen Oogen Vineyard	Earthbound Farm	Monterey County Bank
Chamber of Commerce East Bay	Herald/Mapleton Communications	Pasadena Chamber of Commerce
Chicken Ranch Casino	Macy's Management	Sacramento Regional Center for International Trade Development
David Sandys Hyashi & Wayland	Monterey Bay Aquarium	The Monterey Bay Consultants Group

## TOP Codes for Small Business from 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Titles	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certificates	Noncredit Awards	Total Awards	Total FTES
0501	Business and Commerce, General	1,830	224	42	2,096	8,367
0502	Accounting	1,504	1,796	153	3,453	18,537
0505	Business Administration	4,703	600		5,303	4,298
0506	Business Management	1,169	923	17	2,109	7,339
0508	International Business and Trade	39	95	2	136	495
0509	Marketing and Distribution	176	215		391	2,545
0510	Logistics and Materials Transportation	41	105		146	139
0514	Office Technology/Office Computer Applications	523	1,788	954	3,265	12,900
0614	Digital Media	334	605	13	952	7,039
0116	Agricultural Power Equipment Technology	10	85		95	386
0199	Other Agriculture and Natural Resources	9	7		16	44
0958	Water and Wastewater Technology	106	302		408	778
<b>TOTAL Small Business</b>		<b>10,319</b>	<b>6,351</b>	<b>1,181</b>	<b>17,851</b>	<b>61,660</b>

**Source:** California Community Colleges Chancellor's Office DataMart

**Note:** Given that a lot of small business curriculum spans multiple disciplines, the TOP codes for Small Business (besides 0506.40 Small Business and Entrepreneurship) can vary greatly depending on the focus of a program.

ulum for the Human Resources Administration Certificate and the human resources administration major, curriculum based on current needs in the field of tax and skills/knowledge necessary to pass the Enrolled Agent's Certification Exam, development of a Supervisory Management Certificate and initiation of a management major.

- Santa Barbara City College proposed a small business and entrepreneurship focused grant application based on research that showed an overwhelming majority of employers surveyed indicate a need for workplace employability skills such as communication, appropriate oral and presentation skills, proper workplace etiquette and attire. According to the March 2014 Harris Poll, 77 percent say millennials need soft skills. Employers realize that they can teach hard skills, such as how to use a software program, but it's virtually impossible to retrofit employees

with soft skills. A recent study from Millennial Branding showed soft skills topped the list of "must have" skills that employers want, with 98 percent of employers saying communication skills are essential. Mark Miller, author of *Hiring for Attitude*, notes in *Forbes* that 92 percent of employers believe attitude is key because candidates need to be "motivated to learn new skills, think innovatively, cope with failure, assimilate feedback and collaborate with teammates." Based on this research, Santa Barbara City College's 21st Century Skills Institute will offer soft business skills and new technology training in a leading-edge flipped classroom platform that integrates industry partners with critical problem solving. In lieu of a textbook, students view an expert video playlist (powered by lynda.com), come to class to solve real-world problems, and earn a verifiable digital badge representing a specific skill obtained.

### Top 10 Small Business Occupations from 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
11-1021	General and Operations Managers	267,302	9,478	\$59.83	\$24.94	\$49.94
43-3031	Bookkeeping, Accounting & Auditing Clerks	198,396	5,344	\$20.04	\$12.37	\$19.37
41-1011	First-Line Supervisors of Retail Sales Workers	168,554	6,211	\$19.10	\$11.94	\$17.40
13-1199	Business Operations Specialists, All Other*	138,974	3,902	\$37.81	\$19.11	\$33.88
13-1111	Management Analysts	106,800	5,095	\$40.51	\$22.67	\$36.93
11-9199	Managers, All Other*	84,816	2,911	\$37.95	\$22.39	\$35.91
49-3023	Automotive Service Technicians & Mechanics	75,890	2,547	\$18.41	\$10.28	\$17.27
11-3011	Administrative Services Managers	37,870	1,228	\$46.57	\$24.13	\$42.76
11-2021	Marketing Managers	32,474	1,310	\$70.65	\$35.79	\$65.99
15-1199	Computer Occupations, All Other*	21,522	739	\$40.83	\$21.21	\$40.66
	<b>TOTAL</b>	<b>1,132,598</b>	<b>38,767</b>	<b>\$37.37</b>	<b>\$18.91</b>	<b>\$33.35</b>

**Source:** EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

\*These three SOC codes ending in 99 group together a wide variety of occupations. More detailed labor market research would need to be conducted to refine the job and wage numbers. Caution should be used when making any assumptions based on the number of jobs or wages for these SOC codes.

## Retail, Hospitality and Tourism:

Includes four subsectors: food services, accommodations, activities/amusement and transportation

Technology is transforming the retail, hospitality and tourism sectors. Many of our colleges' culinary arts programs are operating with outdated kitchens and equipment, and they need to be upgraded to current industry standards. Faculty need professional development opportunities to utilize new tools and to develop new curricula to provide instruction to students that reflect current industry standards. Job placement in retail, hospitality and tourism employment often depends on prior work experience. Through the development of structured work-based learning opportunities in partnership with industry, students can be given opportunities to gain work experience.

- In the Orange County region, the hospitality (culinary) sector continues to need trained staff for restaurants, hospitals, hotels and other institutions. At Saddleback College the training facilities at the college need to provide students with the real world tools that meet industry requirements. The college will use CTE Enhancement Fund allocations for equipment and for the upgrade of the kitchens in the culinary

arts program. Specific items include plumbing, grease interceptor, electrical upgrades, circuit and air curtain, refrigerator and blast chiller, oven, as well as the upkeep and maintenance of the edible garden. Funds will also be allocated toward faculty stipends, staff support and professional development.

- In the Central Valley Region at West Hills College, funding is also being used to upgrade the kitchen equipment of its culinary program as well as upgrading the instructional methodologies used in the classroom to include tablet computers to improve on point of sale (POS) instruction. Funding has also been requested to provide professional development to faculty in the use of the tablet technology.
- At Napa College in the Bay Region, the college has requested a CTE EF allocation to integrate wine marketing and destination marketing into the hospitality management program. Funding will be used to revise curriculum and develop industry recognized certificates in eco-tourism, wine

Retail, Hospitality and Tourism			
Bay	6	\$323,945	5.1%
Central/Mother Lode	3	\$150,704	5.5%
Inland Empire	2	\$62,147	2.8%
Los Angeles/Orange County	5	\$384,840	4.0%
North/Far North	0	\$0	0.0%
San Diego/Imperial	0	\$0	0.0%
South Central Coast	1	\$35,000	1.7%
TOTAL	17	\$956,636	3.4%
<p>Nearly 72 percent of the total investment in the retail, hospitality and tourism sector is to be spent on new equipment and upgrades: upgrading kitchens, ventilation, sinks, outdoor cooking station, large appliances, computers, walk-in refrigerators, photo/video equipment, electrical, edible garden, sous vide equipment, etc.</p> <p>Nearly 27 percent of the total investment in the retail, hospitality and tourism sector is to be spent on faculty and staff time for curriculum alignment/development and professional development</p>			

## Top Employers for Retail, Hospitality and Tourism from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Chili's	Hyatt	Portola Plaza Hotel
Cresco and Quality Restaurant Supplies	Marriott	Rutherford Ranch Winery
Disney	Monterey Bay Aquarium	Sodexo
Double Tree Hotel	Monterey Plaza Hotel	Sysco
Elaine Bell Catering	Napa Valley Vintners	The Wine Institute
Embassy Suites Hotel	Pacific Palms Resort	Viking
Hilton Garden Inn	Pebble Beach	

## TOP Codes for Retail, Hospitality and Tourism from the 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Title	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certifications	Noncredit Awards	Total Awards	Total FTES (Credit and Noncredit)
0104	Viticulture, Enology, and Wine Business	34	28		62	288
0113	Food Processing & Related Technologies		4		4	11
0506	Business Management	23	80		103	7,339
0509	Marketing and Distribution	176	215		391	2,545
1306	Nutrition, Foods, and Culinary Arts	379	1237	556	2,172	11,893
1307	Hospitality	186	282		468	1,584
<b>TOTAL Retail/Hospitality/Tourism Programs</b>		<b>797</b>	<b>1,846</b>	<b>556</b>	<b>3,199</b>	<b>23,661</b>

Source: California Community Colleges Chancellor's Office DataMart

## Top 10 Occupations in Retail, Hospitality and Tourism from the 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
41-1011	First-Line Supervisors of Retail Sales Workers	168,554	6,211	\$19.10	\$11.94	\$17.40
35-2014	Cooks, Restaurant	124,777	7,139	\$11.76	\$8.65	\$11.10
35-2021	Food Preparation Workers	118,593	5,670	\$10.24	\$8.39	\$9.41
35-1012	First-Line Supervisors of Food Prep & Serving Workers	89,916	5,720	\$15.39	\$9.87	\$13.92
11-9051	Food Service Managers	47,386	1,433	\$37.95	\$22.39	\$35.91
35-2012	Cooks, Institution and Cafeteria	31,520	1,309	\$62.27	\$25.57	\$55.88
43-4081	Hotel, Motel, and Resort Desk Clerks	24,902	1,642	\$20.18	\$12.94	\$18.59
35-1011	Chefs and Head Cooks	16,153	534	\$14.17	\$9.50	\$13.49
11-9199	Managers, All Other*	12,722	437	\$12.11	\$8.82	\$11.27
11-2022	Sales Managers*	9,166	295	\$21.31	\$10.92	\$19.34
	<b>Total</b>	<b>643,689</b>	<b>30,389</b>	<b>\$21.31</b>	<b>\$12.69</b>	<b>\$19.60</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

\* These two SOC codes are very broad and cover managerial positions in all industries besides just retail, hospitality and tourism. Therefore, only 15 percent of 2013 jobs and annual openings (which equals the percentage of these two SOC codes in just retail, hospitality and tourism industries) is included here in the table.



tasting room sales, event planning and destination marketing. Funding will also be used to provide professional development opportunities for faculty.

- At Skyline College funds will be used to continue the development work of the Hospitality and Tourism Management Program, building career pathways in the following areas: hotel and resort management, restaurant and food and beverage management, and meeting, conference and event management. Funds will also be used for curriculum development, professional development for faculty, the purchase of software and technology equipment to provide hands-on learning of Point of Sale software, Property Management Systems, and meeting and conference software programs utilized in the hospitality and tourism industry.

- At Los Angeles Trade-Technical College, culinary arts programs and curriculum align with similar programs in the region with the exception of providing “production experience” opportunities to its students. With the CTE enhancement funding, Los Angeles Trade-Tech can develop and better provide work-based learning opportunities to address the workforce demand in the region as many hotels in the area will not accept students until they have actual work experience. Providing these opportunities to students will increase job placement and student success rates. In order to meet LMI demands and provide students with hands on experience, funds will be used to upgrade instructional facilities.

## Energy Efficiency and Utilities:

Industries engaged in deploying and managing technologies related to the generation, distribution, storage and efficient use of energy.

### The sector represents two industry clusters:

- **Utilities** encompasses firms that are primarily focused on generating, transmitting and delivering electric power, distributing natural gas and water, and collecting and treating waste water.
- **Energy efficiency** encompasses firms engaged in energy planning and management with the purpose of making new and existing buildings more energy efficient

The utilities segment of this sector is challenged to integrate complex new technologies into the grid infrastructure while replacing approximately 40 percent of its workers who are eligible for retirement over the next few years.

The energy efficiency segment faces a similar challenge to replace large numbers of retirees. Additionally, the segment needs a workforce with higher skills to address new industry standards in a growth market fueled by AB 32, the Global Warming Solutions Act, plus significant public and private investment.

- Cypress College is investing 25 percent of the Enhancement Funds' 60% allocation (~\$120,000.00)

into an energy/sustainability program. Primary use of the funds is for faculty professional development and new and upgraded equipment and instructional aids in direct response to new industry standards and related CTE curriculum.

- A superregional collaborative for HVAC and building management has been formed to develop multi-college career pathways mapped specifically to industry needs. Industry partners and employers include building management companies ABM Facilities Management and Brookfield Asset Management, equipment suppliers Schneider Electric and Trane Corp, plus Southern California Edison and energy management companies.
- Southern California regional HVAC service and installation technicians and related occupations represent more than 24,000 workers. Community colleges in Southern California and related trades apprenticeship programs produce approximately 600 environmental control technology and related program completers each year. Economic growth and incumbent worker attrition through promotion or retirement leaves an estimated annual regional shortfall of 1,800 trained entry level and replacement technicians.

Energy Efficiency and Utilities			
Bay	3	\$215,470	3.4%
Central/Mother Lode	0	\$0	0.0%
Inland Empire	0	\$0	0.0%
Los Angeles/Orange County	7	\$497,857	5.2%
North/Far North	1	\$100,000	3.4%
San Diego/Imperial	0	\$0	0.0%
South Central Coast	0	\$0	0.0%
<b>TOTAL</b>	<b>11</b>	<b>\$813,327</b>	<b>2.9%</b>
Over 80 percent of the total investment in the energy efficiency and utilities sector is to be spent on new equipment and upgrades: solar PV, energy auditing, environmental monitoring technology panels; a trailer to house a mobile lab; PV solar, hot water and concentrated heat solar, wind energy, and geothermal trainers; digital test equipment; computers and software; engineering wide format copier and scanner, etc.			

## Top Employers for Energy Efficiency and Utilities from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

ABM	Interstate Renewables Council	SMUD
Allied Mechanical	Johnson Controls	Siemens
American Society of Heating, Refrigeration & Air Conditioning Engineers	National Environmental Balancing Bureau	Trane
American Wind Energy Association	North American Board of Certified Energy Practitioners	Soligent
Brookfield	North State Building Industry Association	Southern CA Edison
Buetler	PECI	Wattsun
Control Air	PG&E	

## TOP Codes for Energy Efficiency and Utilities from the 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Title	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certifications	Noncredit Awards	Total Awards	Total FTES (Credit and Noncredit)
0199	Other Agriculture and Natural Resources	9	7		16	44
0201	Architecture & Architectural Technology	191	223		414	2,728
0303	Environmental Technology	51	160		211	368
0924	Engineering Technology, General	51	29		80	687
0934	Electronics and Electric Technology	361	1,151	60	1,572	4,200
0945	Industrial Systems Technology & Maintenance	30	157		187	286
0946	Environmental Control Technology (HVAC)	121	691	262	1,074	2,199
0948.40	Alternative Fuels and Advanced Transportation Technology	1	63		64	124
0952.20	Electrical	51	428		479	2,217
0953	Drafting Technology	207	450		657	3,452
0956.80	Industrial Quality Control	1			1	40
0958	Water and Wastewater Technology	106	301		407	778
2102,10	Public Works	8	53		61	50
2206.10	Geographic Information Systems	27	102		129	365
<b>TOTAL Energy Efficiency &amp; Utilities</b>		<b>1,215</b>	<b>3,815</b>	<b>322</b>	<b>5,352</b>	<b>17,538</b>

**Source:** California Community Colleges Chancellor's Office DataMart

## Top 10 Occupations in Energy Efficiency and Utilities from the 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
13-1199	Business Operations Specialists, All Other	138,974	3,902	\$37.81	\$19.11	\$33.88
47-2111	Electricians	59,143	2,067	\$28.47	\$16.94	\$27.36
41-4011	Sales Reps, Wholesale and Manufacturing, Technical and Scientific Products	52,873	2,114	\$43.77	\$19.13	\$37.56
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	25,212	1,179	\$23.39	\$15.00	\$22.90
15-1152	Computer Network Support Specialists	20,613	683	\$36.49	\$21.22	\$34.87
17-3011	Architectural and Civil Drafters	13,306	301	\$27.32	\$17.83	\$26.60
51-8031	Water and Wastewater Treatment Plant and System Operators	10,710	594	\$30.51	\$19.08	\$30.26
17-3029	Engineering Technicians except Drafters, All Other	9,096	286	\$30.83	\$17.54	\$30.84
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	1,565	45	\$35.94	\$22.67	\$38.01
47-2231	Solar Photovoltaic Installers	1,553	53	\$20.49	\$15.07	\$19.24
	<b>TOTAL</b>	<b>333,046</b>	<b>11,224</b>	<b>\$34.99</b>	<b>\$18.45</b>	<b>\$32.00</b>

**Source:** EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed



## Life Sciences and Biotechnology:

Encompasses a group of diverse industries (agriculture feedstock and chemicals, drugs and pharmaceuticals, medical devices and equipment, research testing and medical laboratories and bioscience-related distribution) with a common link – the application of biological scientific knowledge to make products that are useful to humans.

This sector in California is concentrated in three regions: San Diego, LA/Orange Counties, and the Bay Area where the industry is economically critical to the region and provides excellent workforce opportunities for California community college students.

Data from a labor market study completed October 2014 by the Centers of Excellence/Life Sciences Initiative (“Supply and Demand: Life Sciences Middle Skills Workforce in CA”) assisted faculty in understanding and addressing regional challenges and opportunities in the life sciences and biotech sector CTE EF 60 applications. The life sciences and biotech industry can be characterized as entrepreneurial, equipment intensive and investor driven. Therefore, the industry continually invests in equipment to improve efficacy and increase profits. From this standpoint in order to prepare competitive job candidates, students need to practice and learn skills on industry grade equipment to reflect the real-world experience they will need when they gain employment in biotechnology either locally or statewide.

The Orange County Biotechnology Alignment Project includes partners from Santiago Canyon College, Fullerton College, Santa Ana College, and will eventually also partner with Irvine Valley College. The participating colleges have agreed upon three core classes for a basic skills certification with each college choosing an area of specialization for an advanced certificate. This money funds the acquisition of specialized equipment that local industry employers agree will make the trainees aligned with the required industry skillsets. Most colleges cannot afford this equipment or the services of an industry trainer. In the San Francisco Bay Region, colleges are upgrading their biotech courses and programs by purchasing updated lab equipment and materials, including a modular clean room to serve both bio-manufacturing and biomedical programs to train students in current industry standards in a realistic workplace environment.

- **San Diego:** Based on labor market forum and advisory board meetings with industry, employers

Life Sciences and Biotechnology			
Bay	4	\$205,756	3.2%
Central/Mother Lode	0	\$0	0.0%
Inland Empire	0	\$0	0.0%
Los Angeles/Orange County	2	\$132,846	1.4%
North/Far North	0	\$0	0.0%
San Diego/Imperial	2	\$306,463	12.4%
South Central Coast	0	\$0	0.0%
TOTAL	8	\$645,065	2.3%
Over 79 percent of the total investment in the life sciences and biotechnology is to be spent on new equipment and upgrades: an eyewash station, emergency shower, modular clean room, Zoe fluorescent cell imager, cell counter, liquid nitrogen storage system, biosafety cabinet, spectrophotometer, etc.			

hire and retain students on ability to perform skill-based tasks using industry equipment. Investing in new equipment translates to students who are employable and can perform industry-aligned lab skills on current industry-grade equipment. Ability to provide work-based experience for community college students outside using industry-grade equipment and learning basic principles of quality assurance is a must for a program that successfully transitions students to the workplace.

- **Los Angeles/Orange County (LA/OC):** Being taught with proper equipment by industry trainers will allow students to gain the skills necessary for employment. For Santiago Canyon College CTE EF funds will be used to develop industry standard curriculum for this emerging program. Irvine Valley College is proposing to use CTE EF monies to develop a new program in support of the Biotech Regional Alignment Project for Orange County guided by the biotechnology sector navigator. Faculty members at Irvine Valley College, Santiago Canyon College, Fullerton College and Santa Ana College will work together and be supported by the funds. This will bring alignment and cohesion to the Orange County colleges as they address workforce needs.
- **San Francisco Bay:** The funds are being used to accomplish the following:
  - o Maintain and expand equipment for training in biotech and bio-manufacturing CTE programs;
  - o Better train students with more hands on education as opposed to lecture;

- o Make more classes available for students, thereby increasing the number of students; and,
- o Provide work-based standard instruction and contextualized learning.

The Statewide Labor Market Study “Supply and Demand Life Sciences Middle Skills Workforce in CA” ([www.cabiotechcareers.org](http://www.cabiotechcareers.org) Industry Tab, Oct. 2014) was used to inform each of the three regional projects shown above. The study showed that the industry provides a living wage and insight into jobs suited for California community college graduates of the approximately 30 programs in the state. The study broke out the regional workforce needs and showed that program supply is inadequate in LA/OC and the San Diego region, justifying the investment of CTE EF funding. In the Bay Area the region is retooling to develop a pipeline from K-12 to community college to ensure that existing programs continue to meet labor market demand. With the job titles and the portion of the study showing in-demand skills, colleges were able to justify their equipment purchases.

In the Bay Area, faculty specifically stated that “the LMI and reports that were made available to us from the Biotech Marketplace and the help from John Carrese, director of the San Francisco Bay Center of Excellence, ... was extremely helpful...the information helped me to understand what students need to know and what jobs are available...I can better create curriculum if I know what jobs the students are going to be applying to.”

### Top Employers for Life Sciences and Biotechnology from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Amyris	Genentech	Nikon Instruments Inc.
Amgen Foundation	Gilead Sciences	Novartis
Baxter Int.	Grifols	Palo Alto Medical Foundation
Bayer	IDEXX Laboratories Inc.	University of Southern CA (USC)
Bio-marina	Illumina	University of CA (All campuses)
C&C Biologics	Laboratory Corp. or America	VWR/Life Technologies
City of Novato	Marin Biotech	

## TOP Codes for Life Sciences and Biotechnology from the 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Title	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certifications	Noncredit Awards	Total Awards	Total FTES (Credit and Noncredit)
0430	Microbiology	64	189		253	608
0934	Electronics and Electric Technology	361	1,151	59	1,571	4,200
1205	Medical Laboratory Technology	66	121		187	308
<b>TOTAL LIFE SCIENCES/BIOTECH Programs</b>		<b>490</b>	<b>1,461</b>	<b>59</b>	<b>2,010</b>	<b>5,116</b>

Source: California Community Colleges Chancellor's Office DataMart

## Top 10 Occupations in Life Sciences and Biotechnology from the 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	51,824	1,565	\$19.14	\$10.33	\$17.71
29-2012	Medical and Clinical Laboratory Technicians	16,478	1,044	\$21.80	\$13.43	\$20.24
43-5111	Weighers, Measurers, Checkers, & Samplers, Recordkeeping	14,527	519	\$13.54	\$8.87	\$12.14
19-4021	Biological Technicians	11,098	606	\$23.70	\$13.16	\$21.46
17-3029	Engineering Techs except Drafters, All Other	9,096	286	\$30.83	\$17.54	\$30.84
19-4099	Life, Physical & Social Science Techs, All Other	7,869	510	\$24.25	\$13.76	\$21.58
19-4031	Chemical Technicians	5,190	308	\$22.21	\$12.38	\$20.87
19-4091	Environmental Science and Protection Technicians, including Health	4,098	339	\$24.29	\$14.09	\$22.24
51-9011	Chemical Equipment Operators and Tenders	3,003	104	\$23.79	\$13.19	\$22.48
51-9082	Medical Appliance Technicians	1,472	81	\$21.01	\$13.39	\$19.04
	<b>Total</b>	<b>124,654</b>	<b>5,362</b>	<b>\$20.85</b>	<b>\$11.88</b>	<b>\$19.34</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

## Global Trade and Logistics:

Involves the exporting and importing of goods and services across international boundaries, including the logistics, finance, marketing and management of business processes to support trade.

Future economic growth for the state and national economy is dependent upon globalization, namely exports. Exports currently account for 14 percent of gross domestic product. Seventy percent of global economic growth will take place in emerging markets where there is a high demand for U.S. made products, services and technologies, and a growing middle class. Economists estimate that exports will need to double to 30 percent of GDP over the next ten years for the U.S. economy to continue to grow and produce good-paying jobs.

In order to capitalize on global business opportunities, employees in all levels of a firm need to be exposed to global business concepts, global geography and culture, and global business practices, including exporting, importing and logistics, in order to be globally competitive. In terms of the degree that curriculum is globalized, the California Community Colleges ranks 26 according to a study by Michigan State University. California community colleges can add global content to existing courses and create new courses in international business to help globalize curriculum.

- With the CTE EF funding, Chaffey College is purchasing international trade videos and online

resources to provide to faculty to infuse global content into existing courses, which is expected to reach 100 students each year and foster more global awareness.

- In the Los Angeles/Orange County Region, Irvine Valley College plans to coordinate with other community colleges in Orange County to develop a new program with an emphasis on global trade compliance and regulations from a legal perspective since there are a considerable number of international companies, law firms and global trade activities in the region. The money will be used for multi-college marketing materials for their programs and community outreach. Stipends for faculty, conferences, travel, professional development and software are areas where funds will be spent.
- Los Angeles Harbor College and Los Angeles Southwest College are working together to improve their programs to address the need for curriculum to focus on supply chain management. Los Angeles Harbor College will embed the certified global business professional industry certification into the curriculum, providing more and different pathways at each college for global trade and lo-

Global Trade and Logistics			
Bay	0	\$0	0.0%
Central/Mother Lode	0	\$0	0.0%
Inland Empire	3	\$80,985	3.8%
Los Angeles/Orange County	3	\$109,000	1.1%
North/Far North	0	\$0	0.0%
San Diego/Imperial	0	\$0	0.0%
South Central Coast	0	\$0	0.0%
<b>TOTAL</b>	<b>6</b>	<b>\$189,985</b>	<b>0.7%</b>
Over 40 percent of the total investment in the global trade and logistics sector is to be spent on new equipment and upgrades: computers and software, e-textbooks on automated warehousing and video conferencing equipment, etc.			
Over 59 percent of the total investment in global trade and logistics sector is to be spent on faculty, staff and outside consultant/professional's time to develop curriculum, conduct outreach, develop marketing materials, etc.			

## Top Employers for Global Trade and Logistics from the 60% Applications Hiring Students, Donating Time/Supplies, Advising on Workforce Needs

Apec Logistics

## TOP Codes for Global Trade and Logistics from the 60% Applications: Awards and Full-Time Equivalent Students (FTES)

TOP Codes	Program Title	Three-Year Averages 2011-14				
		Associate Degrees	Credit Certifications	Noncredit Awards	Total Awards	Total FTES (Credit and Noncredit)
0501	Business and Commerce, General	1,830	224	42	2,096	8,367
0505	Business Administration	4,703	600		5,303	4,298
0506	Business Management	1,169	923	17	2,109	7,339
0508	International Business and Trade	39	95	2	136	495
0510	Logistics and Materials Transportation	41	105		146	139
0947	Diesel Technology	49	359		408	1,092
<b>TOTAL Global Trade &amp; Logistics</b>		<b>7,831</b>	<b>2,306</b>	<b>61</b>	<b>10,198</b>	<b>21,731</b>

Source: California Community Colleges Chancellor's Office DataMart

## Top 10 Occupations in Global Trade and Logistics from the 60% Applications: Jobs, Openings, Wages

TOP SOC Codes	Occupational Titles	Number of Jobs (2013)	Average Annual Openings (2013-16)	Average Hourly Wage (2013)	10% Hourly Wages (2013)	Median Hourly Wages (2013)
13-1199	Business Operations Specialists, All Other*	138,974	3,902	\$37.81	\$19.11	\$33.88
11-9199	Managers, All Other*	84,816	2,911	\$37.95	\$22.39	\$35.91
11-3011	Administrative Services Managers	37,870	1,228	\$46.57	\$24.13	\$42.76
13-1041	Compliance Officers	29,190	906	\$36.38	\$22.20	\$35.95
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	23,534	818	\$22.99	\$14.55	\$22.71
49-9041	Industrial Machinery Mechanics	22,392	1,228	\$26.58	\$15.99	\$26.12
11-3051	Industrial Production Managers	18,956	347	\$51.27	\$28.13	\$46.36
13-1081	Logisticians	14,268	616	\$39.76	\$24.20	\$38.65
11-3071	Transportation, Storage & Distribution Managers	13,715	484	\$44.33	\$25.61	\$40.56
17-3024	Electro-Mechanical Technicians	2,733	65	\$26.54	\$15.71	\$23.35
	<b>TOTAL</b>	<b>386,448</b>	<b>12,506</b>	<b>\$37.92</b>	<b>\$20.93</b>	<b>\$35.17</b>

Source: EMSI Dataset 2014.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed

\*The two SOC codes ending in 99 group together a wide variety of occupations. More detailed labor market research would need to be conducted to refine the job and wage numbers. Caution should be used when making any assumptions based on the number of jobs or wages for these SOC codes.



## CONCLUSION

The \$50 million CTE Enhancement Fund established in the 2014-15 budget provided California community colleges the opportunity to expand, enhance and improve CTE offerings to their students and communities. This one-time award created opportunities for community colleges to collaborate with each other and industry representatives in seven different macro-economic regions. This collaboration allowed the community colleges to better address the ongoing challenges of providing high quality CTE programs. By providing high quality CTE education, California community colleges can help address the skills gap. Businesses need skilled employees to thrive in a competitive economy. More than 30 percent of jobs in the seven macro-economic regions will require a postsecondary education credential, certificate or associate degree. Likewise, students need the opportunity to earn credentials and advance their skills in order to find high-wage employment. Increased education leads to higher wages for workers and greater prosperity for the region.

However, the full cost of CTE exceeds apportionment funding. The higher costs of CTE comes from the need for smaller class sizes and specialized equipment and facilities. Much of the money awarded through this one-time grant went toward purchasing or upgrading equipment. Students need to train on modern equipment so that they are ready to meet the needs businesses have for skilled employees. Class sizes in CTE programs need to be smaller in order to give students the opportunity for hands-on experience with specialized equipment.

Additional money from the CTE Enhancement Fund was used to provide professional development for faculty. Professors need to stay current with industry developments and changing technology used in their programs. While the CTE Enhancement Fund in the 2014-15 budget went a long way toward helping community colleges by funding much-needed equipment upgrades and professional development, these additional costs are ongoing. Even though CTE has higher costs, it also provides

a higher return on investment in terms of student employment rates and increased wages. CTE programs also provide critical training to meet workforce development needs in industry sectors important to economic growth.

Not only did the California community colleges use the CTE Enhancement Fund to address the higher costs of providing CTE, they also put in place ways to address funding challenges more effectively. The community colleges worked with statewide sector navigators and regional deputy sector navigators to identify priority and emergent sectors in ten industries. They were then able to use labor market information and student outcome data to align regional CTE portfolios that can better meet the needs of businesses and students across the region. Collaboration between colleges within each region allowed them to share resources and leverage their scale to reduce costs. Aligning resources and reducing costs in these ways allow the colleges to provide a greater number of career pathways and opportunities for students.

In conclusion, continuing to provide money in future state budgets for the CTE Enhancement Fund will help thousands of CTE students to achieve their academic goals and find jobs and provide new skills to incumbent workers. Moreover, the investment in regional collaboration through intensive comparison of current CTE courses and programs to labor market needs is the most effective way to address the high cost of CTE programs.

Toward this end, the supplemental language of the 2014-15 Budget Package in Item 6870-101-0001-California Community Colleges requested that this report measure student and workforce outcomes from last year's one-time appropriation of \$50 million. This regional and sector report of this document details the impact of those funds.

To continue this work and also in line with further budget language asking for recommendations for CTE funding in the future, the chancellor of the California Community Colleges requests an ongoing outlay of \$25 million in the 2015-16 budget.

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